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June 1959
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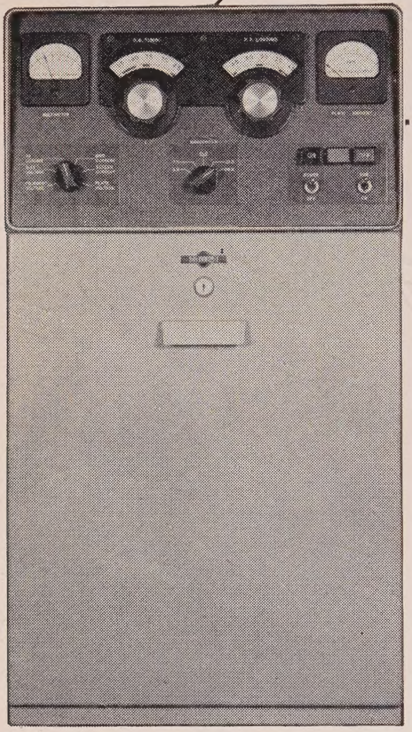
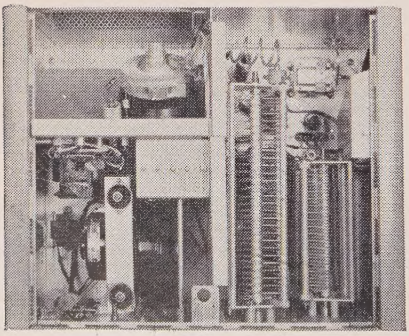
The Radio Amateur's Journal

COLLINS 30S-1 LINEAR AMPLIFIER GIVES YOU:

MAXIMUM POWER
AUTOMATIC LOAD CONTRO
LOW DISTORTION



Simplified front panel controls and compact styling makes the 30S-1 a handsome package only 30⅝" H, 17" W and 16⅝" D.



The compact 30S-1 SSB and CW Linear Amplifier is a completely self-contained, single tube, grounded grid linear amplifier. Requiri 70 to 100 watts driving power, it provides the full legal power input for SSB (1 kw average or 1 kw for CW.

Automatic load control keeps the signal leve adjusted so the 30S-1 is operating at its maxim power capability and also prevents it from bei overdriven. RF inverse feedback is utilized for better linearity.

Front panel switching and simplified contro offer the amateur a bonus in ease of operation optimum operating efficiency. On the 30S-1 correct tuning and loading are indicated by a z reading on a full scale multimeter. The loading control is simply adjusted for zero meter readi while the PA tuning control is operated in the usual manner to obtain minimum plate curren

The frequency coverage takes in all amateu bands between 3.5 and 30 mc. General cover can be had by a simple internal adjustment. The tube used is the Eimac 4CX1000A. The po supply provides all operating voltages for the tube and control circuits, operating from a primary power of 115 v or 230 v ac, 50/60 cp single phase, with 2000 watts max.

See your Collins distributor and examine th other S/Line units—the 75S-1 Receiver and 3 Transmitter, which drives the 30S-1 Linear Amplifier. The Collins KWM-1 Transceiver can also be used to excite the 30S-1.

COLLINS

For further information, check number 1 on page 126.

There's a PR for every Service!

AMATEUR

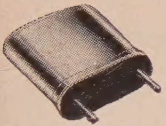
40, 80 and 160 Meters, PR Type Z-2

Rugged. Low drift, fundamental oscillators. High activity and power output. Stands up under maximum crystal currents. Stable, long-lasting, permanently sealed; ±500 cycles..................**$2.95 Net**

20 Meters, PR Type Z-3

Third overtone oscillator. Low drift. High activity. Can be keyed in most circuits. Fine for doubling to 10 and 11 meters or "straight through" 20 meter operation; ±500 cycles........................**$3.95 Net**

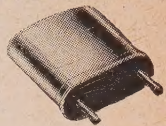
24 to 27 Mc., PR Type Z-9A



Third overtone; multiplies into either 2-meter or 6-meter band; hermetically sealed; calibrated 24 to 27 mc., ±3 kc.; .050″ pins.
$4.95 Net

50 to 54 Mc., PR Type Z-9A

Fifth overtone; for operating directly in 6-meter band; hermetically sealed; calibrated 50 to 54 mc., ±15 kc.; .050″ pins.
$6.95 Net



SPECIAL TYPES

Commercial Crystals available from 100 Kc. to 70 Mc. Prices on request.

Type Z-1, AIRCRAFT

3023.5 Kc., .005%.................................**$3.45 Net**

Type Z-1, MARS and CAP

Official assigned transmitter frequencies in the range.
Calibrated to .005%. 1600 to 10000 Kc. **$3.45 Net**

Type Z-6A
FREQUENCY STANDARD

To determine band-edge. To keep the VFO and receiver properly calibrated.

100 Kc. . . . . **$6.95 Net**

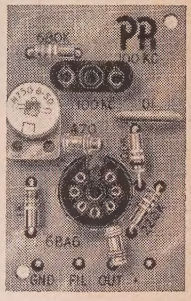
PR PRINTED OSCILLATOR KIT

Has many uses—

- As 100 Kc. Marker
- As 1000 Kc. Marker for Check Points up to 54 Mc.
- As Foundation Circuit for Low Frequency SSB Crystals

Assembled in minutes. Kit contains everything but 6BA6 oscillator tube and crystal.

Each . . . . . **$4.50 Net**



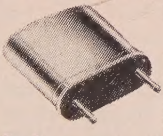
Type 2XP

Suitable for converters, experimental, etc. Same holder dimensions as Type Z-2.

1600 to 12000 Kc. (Fund.) ±5 Kc. . . . **$3.45 Net**

12001 to 25000 Kc. (3d Mode) ±10 Kc. . . . **$4.45 Net**

VHF Type Z-9R, Aircraft



For Lear, Narco and similar equipment operating in the 121 Mc. region, requiring crystals in 30 Mc. range.

Each . . . . **$4.95 Net**

Type Z-9A RADIO CONTROLLED OBJECTS

27.255 Mc., .005% . . . **$4.25 Net**

Type Z-1
TV Marker Crystals

Channels 2 through 13 . . . . . **$6.45 Net**
3100 Kc. . **$2.95 Net**
4100 Kc. . **$2.95 Net**
4.5 Mc. Intercarrier, .01% . . . **2.95 Net**
5.0 Mc. Sig. Generator, .01% **2.95 Net**
10.7 Mc. FM. IF. .01% . . . **2.95 Net**

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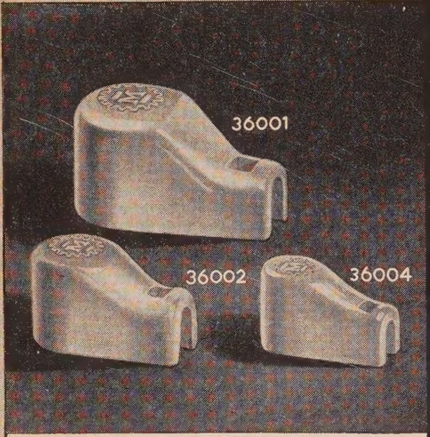
Designed for Application



36000 SERIES
Ceramic Plate or Grid Caps

A new addition to this series of exclusive Millen "Designed for Application" products is the 36004 for use on tubes with ¼" diameter contacts. Efficient, compact, easy to use and neat appearing. Soldering lug and contact one-piece. Lug ears annealed and solder dipped to facilitate easy combination "mechanical plus soldered" connection of cable. No. 36001 for 9/16" tube terminals. No. 36002 for ⅜". No. 36004 for ¼".

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MFG. CO., INC.

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Authors would do well to send for the CQ Styl sheet which will explain our confused system of abbreviations and symbols. The article "Author Author (October 1952 CQ) tells all about how to writ articles for CQ, how much we pay, etc. Reprints o this article are available from CQ if you have bee improvident in keeping up your radio library.

CQ CERTIFICATES:

The WPX Award is granted for two-way conta with certain number of amateurs in different prefixe of the world. Full details are contained in the WP Record Book which is available for 15c from CQ. Application forms are free.

The WAZ Award is granted for contacting all the amateur zones of the world. Current standings amateurs working for this award will be found in th DX column. A DX Zone map of the world is availab free from CQ. Send stamped envelope.

Special SB Certificates are available from the Sid band Department for operators providing proof contact (QSL cards) with stations in 50, 75 and 10 countries using two-way sideband. Send cards direct to the SB Editor.

TECHNICAL INFORMATION:

Please check the 11-year cumulative index which w published in the January 1956 CQ for informati about articles in past issues of CQ. The Decemb 1956 to 1958 CQ yearly indexes will bring you up date. Most back issues are available at $1 from u Check our "Back Issue" ad for details on those n available. Reprints of the Cumulative Index are ava able free. For further information see the Ham Cli column.

DISCLAIMER:

The authors and editors do the best they can make everything as correct as possible in the articl If for any reason any of them should happen to g we hasten to point out that everything is experimen and we guarantee nothing.

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Ted E. Schell, 2700 West 3rd Street, Los Angeles 57, Calif. DUnkirk 2-4889.

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"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.

HEATHKIT VHF-1 **$159.95**

HEATHKIT DX-20 **$35.95**

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as w as the advanced-class CW operator with a low cost transmitter featuri high operating efficiency. Single-knob bandswitching covers 80, 40, 20, and 10 meters using crystals or an external VFO. Pi network output circ matches antenna impedances between 50 and 1,000 ohms. Employs single 6DQ6A tube in the final amplifier stage for plate power input 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supp uses a heavy duty 5U4GB rectifier and top-quality "potted" transform for long service life. Easy-to-read panel meter indicates final grid or pl current selected by the panel switch. Complete RF shielding to minimi TVI interference. Easy-to-build with complete instructions provide Shpg. Wt. 19 lbs.

HEATH COMPANY Benton Harbor, Michigan a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.

HEATHKIT MT-1

$99.95

"COMANCHE" MOBILE HAM RECEIVER KIT

Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube superheterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.

HEATHKIT MR-1

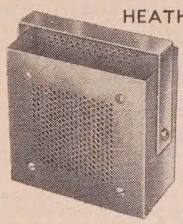
$119.95

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses PM speaker with 8 ohm voice coil. Measures 5″ H. x 5″ W. x ½″ D. Shpg. Wt. 4 lbs.

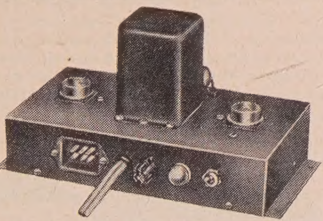
HEATHKIT AK-7

$5.95



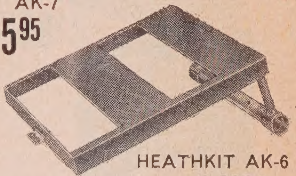
HEATHKIT MP-1

$44.95



MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12′ of heavy battery cable, tap-in studs for battery posts, power plug and 15′ of connecting cable. Chassis size is 9⁵⁄₁₆″ L. x 4¾″ W. x ″ H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.



HEATHKIT AK-6

$4.95

MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT

This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

HEATHKIT PM-2

$12.95

HEATHKIT

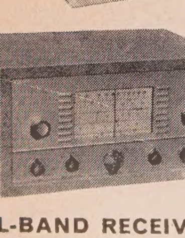
COMPANION UNITS

HEATHKIT TX-1 $\$234^{95}$

"APACHE" HAM TRANSMITTER KIT

The many features and modern styling of the "Apache" will provide you with just about everything you cou
ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone inp
and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provid
for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stab
VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rota
ing VFO dial with full gear drive vernier tuning provides ample bandspread and precise frequency setting
The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit al
has adjustable low-level speech clipping and a low distortion modulator stage employing two of the ne
6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-
CW operation. The final amplifier is completely shielded for TVI protection and neutralized for great
stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provid
accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to t
attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 a
72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putti
the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstandi
unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

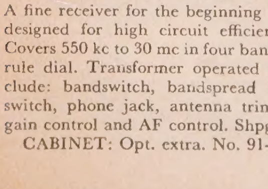
HEATHKIT SB-10 $\$89^{95}$



SINGLE SIDEBAND ADAPTER KIT

Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit
you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functi
of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-10
transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tu
the adapter employs the phasing method for generating a single-sideband signal, thus allow
operation entirely on fundamental frequencies. The critical audio phase shift network is suppl
completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or D
signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-
read panel meter indicates power output to aid in tuning. A built-in electronic voice control w
anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is
excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used
linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adap
Model MK-1. Shpg. Wt. 1 lb. **$8.95**.



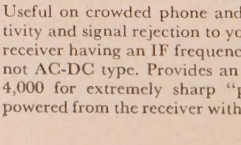
HEATHKIT AR-3 $\$29^{95}$

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. $4.95.



HEATHKIT QF-1 $\$9^{95}$

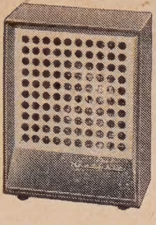
"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds se
tivity and signal rejection to your receiver. Use it with any
receiver having an IF frequency between 450 and 460 kc th
not AC-DC type. Provides an effective "Q" of approxima
4,000 for extremely sharp "peak" or "null". The QF-
powered from the receiver with which it is used. Shpg. Wt. 3

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8″ speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive ⅜″ plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.



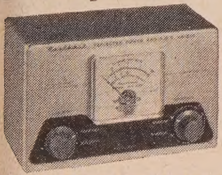
HEATHKIT AK-5

$9.95

HEATHKIT RX-1 $274.95

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandspread. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.



HEATHKIT AM-2

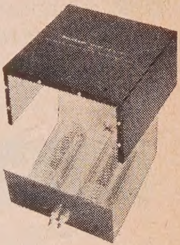
$15.95

REFLECTED POWER METER KIT

The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

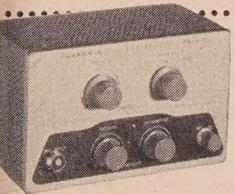
BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



HEATHKIT B-1

$8.95

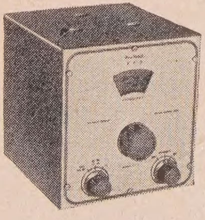


HEATHKIT VX-1

$23.95

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.



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$19.50

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs.

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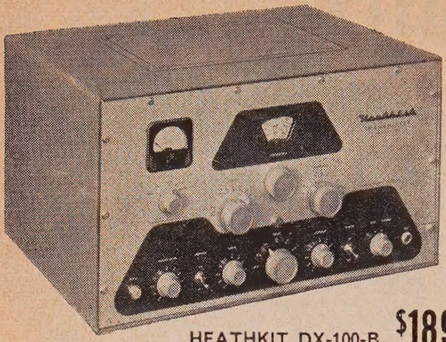

HEATHKIT DX-100-B **$189⁵⁰**

HEATHKIT DX-40 **$64⁹⁵**

DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides bo
phone and CW operation on 80, 40, 20, 15 and 10 meters.
single 6146 tube is used in the final amplifier stage to provi
full 75 watt plate power input on CW or controlled carr
modulation peaks up to 60 watts for phone operation. Mod
lator and power supplies are built in and single-knob ban
switching is combined with the pi network output circuit
complete operating convenience. Features a D'Arsonval mo
ment panel meter. A line filter and liberal shielding provid
for high stability and minimum TVI. Provision is made
three crystals easily accessible through a "trap door" in
back of the cabinet. A 4-position switch selects any of the th
crystals or jack for external VFO. Power for the VFO is ava
able on the rear apron of the chassis. Easy-to-follow step-by-s
instructions let assembly proceed smoothly from start to fin
even for an individual who has never built electronic equ
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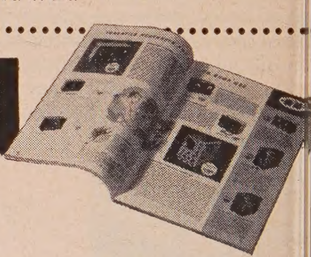
HEATHKIT



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CITY ZONE STATE

QUANTITY	KIT NAME	MODEL NO.	PRICE

For further information, check number 5 on page 126.

editorial / WAYNE GREEN

de W2NSD

never say die

Operation World Wide . . . Our Cover

Ralph Charbeneau, W8OLJ, of Detroit, has worked out one of the best ideas for promoting amateur radio on a nation-wide scale that has come up in a long, long time. His Operation Worldwide could have long range effects which would be of benefit to the hobby for years. He is flying ham radio around the world on a Military Air Transport System C-54 and is scheduled to stop at 24 different countries. Installed aboard the plane is one of the new Hallicrafters FPM-200 transistorized single sideband transceivers, driving a HT-33A Linear Amplifier, which will be used during most of the flight, except over a few countries, where permission for this was not given.

The round-the-world flight was set up by Ex-Cello-O Corporation's Pure-Pak Division to produce a documentary film of the Military Air Transport Service (MATS). Ex-Cell-O pays for the film and crew, MATS provides the plane, and MATS gets a film of it's operations out of the deal. One aspect of the film will be the milk reconstituting plants in many parts of the world which manufacture milk from powder . . . the milk is then distributed in Pure-Pak containers. Ralph is director of Public Relations for Ex-Cell-O and, like any other ham, jumped at the chance to take a rig along on the trip.

A base station has been set up in Detroit to keep in touch with the flight. This station, W8USA, is at the WWJ-TV transmitter site and is being manned by volunteer NBC Hams.

Tapes will be made on the plane of all contacts and mailed back at each stop to NBC in New York. There, the material will be checked over and the more interesting segments put together for weekend broadcasts on NBC's Monitor program. Naturally permission will be requested from all for re-broadcasting. Some of the contacts which should be of particular interest to the general public will be with hams in rare spots and phone patches to many of the state Governors.

Permission has already been received for airborne operation over several of the countries on the trip. Operation on the ground will also be carried on wherever possible. The license for FL8OLJ (Fr. Somaliland) has been received through the kind cooperation of Mr. Bernard Malandain, F9MH, the French Consul in New York.

Operation Worldwide is extremely well placed in time, for it will put world wide emphasis on ham radio just before the Geneva conference . . . this just when we need all of the good publicity we can get.

Most of the operating will be sideband on ten and fifteen meters. While in Zone 2, there will be some twenty meter operation . . . 14,295 *kc*. Look for the plane on 21,435 *kc* and 28,685 *kc* if you would like to get a few more rare ones, or just say hello. If the pileups get too high, there may be some QSY'ing. Every effort will be made to contact all the amateurs who call in. The MARS frequency will be 14,405 *kc*.

Some of the unusual countries on the itinerary of the flight are: Egypt, Turkey, French Somaliland, Ceylon, Thailand, Korea, Formosa, Okinawa, Guam, Wake Island and Japan. Special QSL cards are being printed for the trip. QSL via W8OLJ, Operation World-Wide, Franklin, Michigan.

The net result of this trip will be to put ham radio in the public eye, not only in this country, but all over the world. Many governors of states will have the excitement of talking to a plane that is half way around the world via ham radio . . . an experience they are not likely to forget.

Several of the countries involved have turned down the request for permission to operate on the basis that the United States does not reciprocate. It is unfortunate that a country such as ours which has taken the lead in so many other ways should be so much behind almost all others in this respect. The U.S. will modify its stand on this when enough amateurs take the trouble to write to the ARRL, the FCC and their Congressmen and tell them that this is what they want. Just imagine the effect on foreign amateurs if they were able to visit our country and get on the air for local rag chews rather than the usual short DX contact. I'm sure that we could see a lot of them taking advantage of the privilege. I'm also sure that U.S. amateurs would flock to many of the rarer countries where they must now remain as just a visitor and bring along a transceiver.

Big Publicity

As I travel around and talk to more and more hams personally, I am distressed by the lack of interest so many have in the perpetuation of their hobby. The attitude seems to be that, "I like to rag chew . . . or work DX, but I'm not interested in politics." So many seem to feel that with the payment of a few dollars dues to ARRL they have done all that needs to be done. "Let the ARRL take care of things, that's what we pay 'em for, isn't it?"

If you will take a good look at some of the material we've rounded up for you in the editorial this month, maybe you'll agree that the job to be done is beyond the capabilities of the few paid staffers of ARRL, good men though most of them are. The former reluctance of commercial (and even military) users of fre-

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The Master Course in Electronics will provide you with the mental tools of the electronics technician and prepare you for a First Class FCC License (Commercial) with a radar endorsement. When you successfully complete the Master Course, if you fail to pass the FCC examination, you will receive a full refund of all tuition payments.

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Name and Address	License	Time
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In what kind of work are you now engaged?..........

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quencies to consider expropriating amateur frequencies has been rapidly dissolving under the increased desperation of necessity. The amateur has had to continuously move over and make more room for other services in spite of the fact that his own bands were filling to unprecedented signal densities with more and more stations.

Loran has almost extinguished one of our best amateur bands . . . 160 meters. Eighty is alive with foreign commercial stations. All but the low end of forty is nightly reduced to a shambles by foreign broadcast stations and jamming. Even twenty meters is periodically invaded by commercial RTTY and other non-amateur signals . . . and shall we say a short prayer for our dearly beloved but departed 14,350 to 14,400 kc? That used to be an amateur band you know. You ask about eleven meters? Ah yes, that's gone too. And don't forget the high end of ten meters . . . 29,700 to 30,000 kc . . . that used to be ours. Shall we include our 220 mc, 420 mc, and up bands, which are scheduled for high power radar occupancy? Why not!

And, as we have watched the attrition of our frequencies we have watched our ranks grow from about 50,000 to the present almost 200,000! Something is wrong! We are getting more and more stations on fewer and fewer frequencies. This year there is an internationally concerted effort to lop off the top half of 80 meters, the top 200 kc of forty, and the 29,000 to 29,700 kc band. Thus by 1961 we might possibly see 350,000 hams (250,000 in the U.S.) gamely trying to survive in a 25 kc wide 160M band, a 250 kc wide 80M band, a 100 kc wide 40M band, our presently overcrowded twenty and fifteen meter bands, and a one half size ten meter band . . . and, oh yes, six and two meters, should they be still with us.

Or would you rather do something about it? All of this can only happen if the majority of us don't care enough to pitch in and spend some effort, other than our time on the air.

Perhaps we have an inferiority complex about the Amateur Service. Perhaps we have a nagging feeling that Short Wave broadcasting or commercial RTTY communications are more important than our usual drivel. After listening to a few fellows carrying on low grade contacts on Twenty phone I'll admit that it strains the credulity a bit to justify this sort of thing as Necessary. But before we break our back bending over to apologize for our use of these precious frequencies, perhaps we should take a fast look at the commercial, military and government propaganda services. They have even less justification for the fantastic wastage of channels that our present allocation system produces. All you have to do is tune up and down the commercial bands and you will see that the great bulk of channels are being held down with code wheels. Each

New!

hallicrafters "2 and 6"

Also
available—
A. C.—only model

World's first complete two and six meter radio station... features transistorized, built-in power supply

Approved for
FCDA matching funds—
OCDM#U-68 and
#-70.

COMPLETE SPECIFICATIONS

General description: The SR-34 is designed for either AM or CW and combines, for the first time in one compact package, the complete functions of a two *and* six meter radio station. It operates on 115-V. A.C., 6-V. D.C., or 12 V. D.C. and features a highly efficient transistorized power supply for the 6 and 12 volt operation.

Exclusive features: The perfect unit for short-range portable, fixed or mobile communication, the SR-34 meets—and exceeds—F.C.D.A. matching-fund specifications. The crystal sockets and transmitter tuning controls are concealed behind a panel which may be sealed to prevent tampering. Instantaneous selection of desired voltage possible and also "crossbanding" between the two and six meter bands. The specially designed cover has mounting clips for two-band antenna, owner's microphone, and cords.

Both receiver and transmitter may be used for C.W.; key jack and adjustable B.F.O. are provided. Drip-proof case is specially designed for safe outdoor use.

The transmitter is crystal-controlled; up to four crystals may be switch-selected. A fifth position on this switch permits external V.F.O. operation. Band selection also is front-panel controlled.

The receiver is a double conversion superheterodyne, having a quartz crystal controlled second oscillator. This offers outstanding selectivity and high image rejection. Highest stability is obtained through separate oscillator and R.F. sections for each band.

All receiver functions provided—S-meter B.F.O., ANL, etc. Sensitivities average 1 microvolt on both bands. Transistorized power supply eliminates noisy, erratic operation encountered with vibrator-type power supplies.

Front Panel Controls: *Receiver:* Band Selector (49-54 mc., 143.5 to 148.2 mc.); Main Tuning; Sensitivity; Audio Volume; B.F.O. Pitch; Squelch Level; Headphone Jack. *Transmitter:* Function Switch (P.A., Rec., Cal., AM, CW); Power On/Off; Band Switch; Crystal Selector and V.F.O.; Oscillator Tuning; Doubler Tuning; Tripler Tuning; Final Tuning; Final Loading; Meter Switch.

Power output: 6 to 7½ watts on 2 meter, and 7 to 10 watts on 6 meter AM or CW, 100% mod. negative peak clipping. *Rear Apron:* Speech input level control; key jack; P.A. speaker terminals; mic. selector (high Z or carbon); mic. input; A.C. and D.C. fuses; power plug.

Available with convenient terms from your Radio Parts Distributor.

Export Sales: International Division, Raytheon Manufacturing Co., Waltham, Massachusetts
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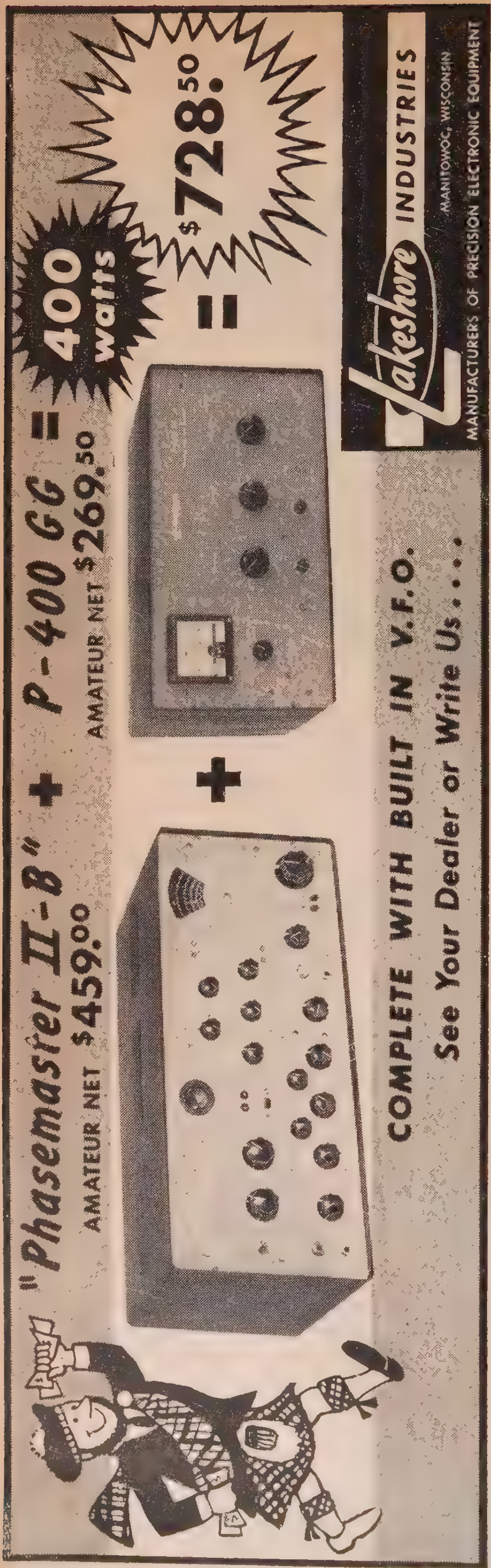
In our 25th year of service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See Your Dealer or Write Us . . .
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MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

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branch of the military (and several other government agencies) in our country have long lists of frequencies for their use. If these lie idle for long there are other agencies that are after them . . . so they put on test tapes, code wheels, tones, etc. Ditto this procedure for all the commercial users of frequencies and all of the foreign governments and you get a fantastically complicated net work of channel being held for possible use,. for use during certain hours of the day, etc., and an overall efficiency that approaches zero.

Is the answer to this problem to take more channels from the only unorganized user of frequencies: the amateur? Or would it be better to try to work out some sane system of using the radio spectrum. After all, we only have a few frequencies left for them to expropriate, what are they going to do when these are fitted into the same 99% waste pattern and are filled to the brim with RY's, Quick Brown Dogs, and the everpresent buzz saws of the Soviets trying to bollix what is left?

Actually we have plenty of justification for using our share of the radio spectrum. Commercial and government radio services cannot possibly render the emergency service of ham radio. The Navy found this out when they were called upon to provide morale communications for men wintering over in Antarctica. Extensive as Naval communications were they couldn't possibly hope to even touch the problem of providing such a service. They *had* to use ham radio. With every flood, hurricane, and other natural disaster we find that ham radio is the only service that is 100% effective. We serve in thousands of other ways too. We are valuable, for all of the babble that we gush forth. But we have to keep mentioning it lest they forget how valuable we are. We have to jump at every chance for publicity. We have to beat our drum.

What can you do? Well for one, you can keep yourself up to date on what is going on. Then you can try to find out who your Congressman is and let him know that you know who he is and that you are an amateur and are interested in his doing all he can to get the U.S. to correct the non-reciprocal licensing problem. You can bring up for discussion the latest problems facing our hobby at your club meetings. You can discuss ways of getting ham radio known in your community or your state. You might even have someone in a position to do a world-wide publicity job such as W8-OLJ's Operation World-Wide. You can set up a ham radio exhibit at local fairs. You can organize your club to make a documentary movie of some facet of the hobby or some service that it renders. CQ will be glad to assist in the distribution of these films to other ham clubs if you will let us know about them. You see, there are a lot of things you can do if you are really interested in hamming. You can probably come up with a lot longer and better list for the best buys ever...

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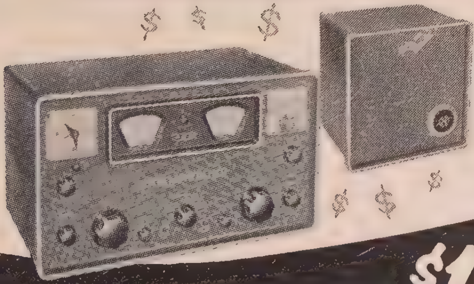
CURRENT BEST-SELLERS... OFFERED AT REAL "COME-AND-GET-THEM" PRICES FROM MAY 15th TO JUNE 30th...

You've never had an opportunity like this before! The world's most popular communications receivers offered at real, solid savings. For a limited time only—from May 15th to June 30th—you can get the bargain of your lifetime. Check with your Hammarlund distributor...

You buy the general-coverage HQ-100 receiver at the regular price of $189.00. Add $1.00 and you get the Telechron clock-timer ($10.00 amateur net) and matching S-100 Speaker ($14.95 amateur net). Total value, $213.95. Total cost

$190.00



The amateur-band HQ-110 sells for $249.00, regular price. You pay $1.00 extra and you get the Telechron clock-timer (Amateur net $10) and the S-100 Matching Speaker ($14.95 amateur net). Total value, $273.95. Total cost

$250.00

$1.00 gets you $24.95!

HAMMARLUND

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460 West 34th Street, New York 1, N.Y.

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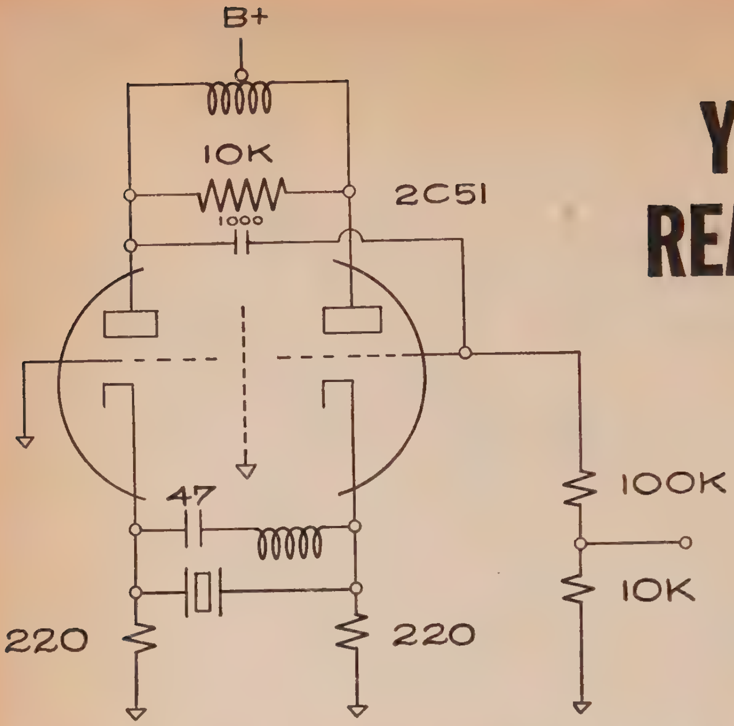

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GONSET'S Two new all-band receivers

43

G-43 offers peak reception over a wide frequency range . . . sensitivity . . . selectivity . . . highest quality components and materials . . . a fine blend of high performance features and economical pricing.

33

G-33 has the same basic features as G-43, but incorporates certain design simplification which permits exceptionally reasonable pricing with little sacrifice in performance.

G43 Features high stability and great ease of tuning by use of a 6-band tuner covering the following ranges: .54-1.6 mc, 1.8-5.7 mcs, 5.7-13 mcs, 13-20 mcs, 20-25 mcs, 25-30 mcs . . . Employs drum dial for quick identification of band in use . . . bandspread dial provides calibration of an amateur band on each range, as well as a logging scale . . . calibrations on band 6 provide for use of VHF converters . . . has 6 double-tuned Hi-Q transformers at 1650 kc in I-F section . . . selectivity: 6 kc at 6 db down, 24 kc at 60 db.

Panel controls include: Main tuning, Bandspread tuning, Bandswitch, Audio volume, Sensitivity, Antenna trimmer, ANL on-off, xtal calibr. on-off, Phone-CW, Standby-Receive . . . signal strength meter . . . provision for internal crystal calibrator accessory, available as optional equipment . . . muting connections. Tube complement: 6BE6 (conv), 6BA6 (1st I-F), 6BA6 (2nd I-F), 6AU6 (3rd I-F), 6AL5 (det, AVC, ANL), 12AX7 (1st Audio-BFO), 6CM6 (2nd audio), 6X4 (rect).

G33 Tunes to the following ranges: Band 1, .54-1.6 mc; Band 2, 1.8-6 mcs; Band 3, 6-13 mcs; Band 4, 13-34 mcs . . . bandspread dial provides logging scale and calibrated scales for amateur bands. 1650 kc I-F system results in greatly improved image rejection . . . 3 double-tuned Hi-Q transformers provide excellent selectivity.

Panel controls include: Main tuning, Bandspread tuning, Bandswitch, Audio volume, Antenna trimmer, Sensitivity, and Function selector . . . Tube complement: 6BE6 (conv), 6BA6 (1st I-F), 6BA6 (2nd I-F, BFO), 6AV6 (det, AVC, 1st audio) 6CM6 (2nd audio), 6X4 (rect.)

External speaker is available as an optional accessory. 6" by 9" speaker is contained in an attractive cabinet designed to match receiver, and blend with surroundings. Has headphone jack and tone control.

For further information, check number 9 on page 1

GONSET

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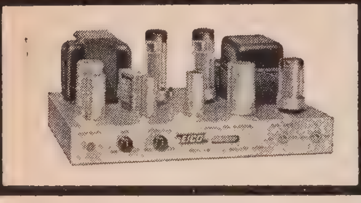
Ideal for Vet or Novice—Elec. Kits Guide

New

90-WATT CW TRANSMITTER . . #720
KIT $79.95 WIRED $119.95

Conservative, highly efficient design plus stability, safety, and excellent parts quality. 80 thru 40, 20, 15, 11, 10 meters (popular operating bands) with one knob bandswitching. 6146 final amplifier for full "clean" 90 W input, protected by clamper tube. 6CL6 Colpitts oscillator, 6AQ5 clamper, 6AQ5 buffer-multiplier, GZ34 rectifier. "Novice limit" calibration on meter keeps novice inside FCC-required 75W limit. No shock hazard at key. Wide range, hi-efficiency pi-network matches antennas 50-1000 ohms, minimizes harmonics. EXT plate mod. terminals for AM phone modulation with 65W input. Excellent as basic exciter to drive a power amplifier stage to max. allowable input of 1KW. Very effective TVI suppression. Ingenious new "low silhouette" design for complete shielding and "living room" attractiveness. Conservatively rated parts, copper-plated chassis, ceramic switch insulation. 5" H, 15" W, 9½" D.



NEW UNIVERSAL MODULATOR-DRIVER #730
KIT $49.95 WIRED $79.95 Cover E-5 $4.50

Superb, truly versatile modulator at low cost. Can deliver 50 W of undistorted audio signal for phone operation, more than sufficient to modulate 100% EICO #720 CW Transmitter or any xmitter whose RF amplifier has plate input power of up to 100W. Multi-match output xmfr matches most loads between 500-10,000 ohms. Unique over-modulation indicator permits easy monitoring, no need for plate meter. Lo-level speech clipping & filtering with peak speech freq. range circuitry. Low distortion feedback circuit, premium quality audio power pentodes, indirectly heated rectifier filament. Balance & bias adj. controls. Inputs for xtal or dynamic mikes, phone patch, etc. Excellent deluxe driver for high-power class B modulation. ECC83/12AX7 speech ampl., 6AL5 speech clipper, 6AN8 ampl. driver, 2-EL34/6CA7 power output, EM84 over-mod. indicator, GZ34 rect. Finest quality, conservatively rated parts, copper-plated chassis. 6" H, 14" W, 8" D.

NEW GRID DIP METER . . . . . #710
KIT $29.95 WIRED $49.95 including complete set of coils for full band coverage.

Exceptionally versatile. Basically a VFO with microammeter in grid: determines freq. of other osc. or tuned circuits; sens. control & phone jack facilitate "zero beat" listening. Excellent absorption wave meter. Ham uses: pretuning & neutralizing xmitters, power indication, locating parasitic osc., antenna adj., correcting TVI, de-bugging with xmitter power off, determining C,L,Q. Servicing uses: alignment of filters, IF's; as sig. or marker gen. Easy to hold & thumb-tune with 1 hand. Continuous 400 kc—250 mc coverage in 7 ranges, pre-wound 0.5% accurate coils 500 ua meter movement. 6AF4(A) or 6T4 Colpitts osc Xmfr-operated sel. rect. 2¼" H, 2$\frac{9}{16}$" W, 6⅞" L Satin deep-etched aluminum panel; grey wrinkle steel case.

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For further information, check number 10 on page 126.

than I did . . . I just wanted to get the thought across.

Keep in mind that few countries will go out on a limb to support the elimination of ham frequencies if they believe that there will be a violent reaction from the U.S. hams. We might mention on the air when talking to hams in European countries (and others) that we certainly hope that their delegation will not support the proposed reductions of our bands . . . and urge them to put whatever pressure they can on their friends to also pass along the word. If, say, the Italian delegation were to find out that 200,000 Americans were going to do everything in their power to keep their families and friends from touring Italy or buying Italian products as a result of their vote on the forty meter allocation, they certainly would have some serious second thoughts before going ahead. Such organized retaliation would be a fearsome weapon. It might even be that they could manage to find some other frequency for one of their short wave transmitters.

The Amateur's Rights

In the March 27, 1959 issue of ELECTRONICS, an article, "Politics clouds Spectrum Issue," very cogently explains the VHF-UHF allocations situation in the United States. The amateur and his bands were not mentioned. But reading between the lines there is a lot of food for thought—for all of us.

The old amateur 27 *mc* band is now gone and there is a rush by some manufacturers for the "old band wagon" to get equipment into the hands of the new occupants of this portion of the radio frequency spectrum. The question (after reading the article mentioned above) is this: were politics involved in taking this band away from the hams? We will reserve our own opinions.

The radio amateur realizes (we hope) that in order to hold on to any band, the band must be used and used wisely. There can be no doubt that the bands now allocated in the United States to the radio amateur service are being used to the "hilt". What with more amateurs coming on the air every year, it looks like the hams will need more, not less spectrum space.

The FCC in its opinions refers to its recogniiton of the ARRL as the "representative body of the American radio amateur"—*now*. However, do not get the idea just because you do not belong to the ARRL and are a licensed ham that you do not have representation. Remember this and remember it well: your congressman represents *you* as well as thousands of other constituents; your vote helped to put him in office. He was not elected by a "board of directors", but by *your* direct vote.

If a new central frequency control agency is formed within our government (which will

NTERNATIONAL'S NEW

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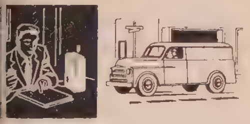
CHECK THESE ADDED FEATURES!

- ✓ Choice of tunable or crystal controlled receiver
- ✓ BUILT-IN Squelch
- ✓ Add a crystal & switch for second transmit channel

CUSTOM, 117V AC, all channel receiver	**$94.95**
DELUXE, 117V AC or 6/12V DC	**124.50**
COMMAND, 117V AC or 6/12V DC fixed channel receiver	**149.50**

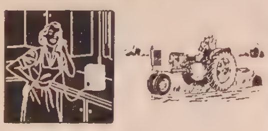
MEETS ALL FCC REQUIREMENTS

FOR BUSINESS



deal for office-to-field communication. Also for office to trucks operating within restricted area or for office and factory liaison.

FOR THE FARM

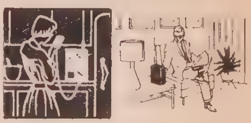


The solution to fast communication from the farm home to the field. Wonderful in an emergency.

FOR SPORTS

From ship-to-shore or from base camp to the scene of the hunt . . . an enjoyable accessory to any sport!

FOR THE HOME



From the kitchen to the den, workshop or sickroom . . . the Transceiver will save you many steps.

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For further information, check number 11 on page 126.

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The extensive CENTRALAB line of ceramic capacitors includes the unit you need. For any ham, industrial or military application, you can depend on CENTRALAB. Low voltage transistor, high voltage, general purpose, temperature compensating, variable and transmitting applications . . . whether you need disc, tubular, plate, feed-thru or trimmer capacitors, your best and quickest source is your CENTRALAB distributor.

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report directly to the President), we hams would like to have qualified radio amateur representation on that board or commission. Such representation to be chosen by majority vote of ALL RADIO AMATEURS through ballots distributed through the FCC. Industry, the military etc., would also be represented and their representatives selected by vote or by *authorized* appointment.

We do not wish to see the ARRL abolished—far from it. But until EVERY amateur is a member of the League and has a DIRECT vote not only for the Directors but the Secretary, Business Manager, etc. it cannot possibly do the job it is supposed to do.

The American Radio Amateur needs and MUST have DIRECT representation at conferences on an International scale—and not merely advisors standing by waiting to be called on for an opinion which does not *always represent majority* desires.

If the new frequency commission "jells"—contact your congressman and let him know how you feel and ask him for his assistance. Those who represent the American Radio Amateur should occupy office by *direct* majority vote and only retained if their record of achievement warrants retention. Corporational regulations do not have the "teeth" in them that a directly elected Federal commission would be governed by.

The howls will go up—but make sure who the "howlers" really are before you do any opinionating. You can be sure they will be the ones who are worrying about their jobs and the good money they are getting instead of the rights of the American Radio Amateur.

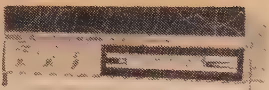
The Wireless Institute of Australia on Geneva!

We've had some interesting comments from G. Maxwell Hull, VK3ZS, president of the Wireless Institute of Australia with reference to the up and coming Geneva Convention. Seems that there are quite a few people that are interested in the position of Amateur Radio at the close of the convention. Briefly, he says:

"We have been concious for many years that the pressure for frequencies by the commercials would be solid at the next ITU convention, and in this regard we have written editorials, sent out memos and generally pursued a policy of telling the Australian amateur that he must 'use them or lose them' to quote an oft heard phrase; that he must contribute more to his hobby than just playing around on the bands, that he must organize himself into something of public worth such as Civil Defense Networks and the like as well as continuing his general activity of rag-chewing and experimenting."

"In Australia, the Postmaster General's department is blessed with the task of looking after frequencies with the assistance of other government bodies. Some years ago a group known as the Frequency Allocation Sub Com

New Citizens Broadcaster CB-100



11 M TRANSCEIVER
FOR USE BY ANYONE
NO EXAMINATION
Just fill out FCC Form 505

Complete with Xtals. for One Channel & Mike

$129.95

For home, office, car, boat, field, etc. 115VAC or 12V mobile. Exclusive 3-channel selection switch and button light indicators. Squelch control for muting background noise. 10-tube receiver/transmitter, xtal. controlled. AM modulated. Meets all FCC specs. Compact: 3½x13x10½"; 9 lbs. Carry handle for tilt stand or permanent mounting.

New Globe Champion 350

350w CW, 275w AM
450w (PEP) SSB - DSB (Suppressed Carrier)

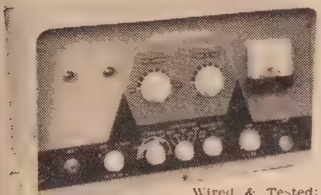
W/T: $495

- ★ **All modern design new cabinet**
- ★ **New filtered keying circuit virtually eliminates key clicks**
- ★ **Improved VFO circuitry for greater stability**
- ★ **Tailored for more "power punch" in the voice frequency range**
- ★ **Improved shielding for TVI-protection and stability, eliminating RF feedback**

Revised and tested to perfection, this 10-160M bandswitching transmitter is TVI-suppressed, filtered & bypassed. Built-in VFO. High level Class B modulation with new compression circuit. Pi-Net output, 48-300 ohms. Push-to-talk, antenna changeover relay, time sequence keying. Single knob bandswitching.

Work AM, CW & Single Sideband with the Sidebander DSB-100

100w PEP DSB, Suppressed Carrier



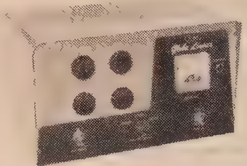
Wired & Tested: **$149.95**
In Kit Form: **$119.95**

Double Sideband, AM, CW at Low Cost

A complete Xmttr., self-contained, bandswitching 80-10M, 100w PEP DSB Suppressed Carrier, 40w AM, 50w CW. Min. 45db carrier suppression. 3-stage RF section allows straight through operation. Automatic balancing & floating grid circuit. Speech clipping & filtering for min. band width. Accessory socket on chassis rear apron. Use barefoot or as driver for higher power Xmttr. Covers most MARS and CAP frequencies.

Globe Linear LA-1

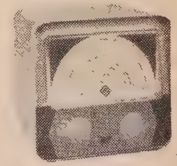
Grounded Grid, Class B or C



W/T: **$124.50**
Kit: **$99.50**

For 6-80M, complete with well-filtered power supply, 200w input AM Class B, 300w DC or 420w PEP input Class B linear SSB or DSB. 300w Class C for CW. Pi-Net 80-10M; 52 ohm Pi-Link coupled on 6M. Extensively TVI-protected. Meter for monitoring final plate currents also indicates approx. RF output voltage enabling operator to tune for max. efficiency and output.

Globe VFO 755A

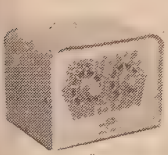


W/T: **$59.95**
Kit: **$49.95**

10-160M

Complete with well-filtered power supply with voltage regulation. Output on 40 & 160M. Vernier drive with shock absorbing features. 13:1 tuning ratio. Approx. 50 RF volts output. Temperature compensated for utmost stability for DSB, AM, CW.

Vox, Model 10



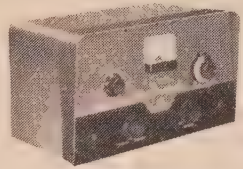
For voice operated control of the DSB-100 as well as the Champ and other similar transmitters. Extra contacts for auxiliary circuits. Simply plugs into rear of DSB-100.

QT-10

An anti-trip accessory for the VOX, Model 10.

VOX, Wired & Tested: $29.95
Kit: $19.95 **QT-10: $9.95** Wired

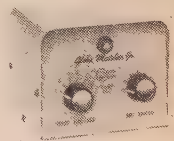
Globe Matcher Sr., AT-4



Wired: **$79.50**
Kit: **$69.50**

Antenna tuner with built-in SWR bridge for any Xmttr. with final RF input up to 600w, 80-10M. Fixed link coupling. Coax input, 2-wire balanced or unbalanced output. Built-in switch allows bypass of tuner circuits for coax input and output. Special calibrated panel meter for monitoring actual SWR. Vernier dial.

Globe Matcher Jr., AT-3



Wired: **$15.95**
Kit: **$11.95**

Antenna tuner for power input 100w CW, 75w fone, or less. Substantial amount of harmonic attenuation when properly tuned. Aids matching Xmttr. output to various antennas. Unbalanced output. Forward Look cabinet of steel for TVI-prevention.

Globe Scout 680A

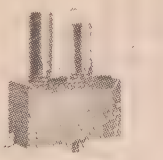
for 6-80 Meters

Wired: **$119.95**
Kit Form: **$99.95**

Plate Modulated — 65w CW, 50w AM

Completely bandwitching, self-contained, with built-in power supply. High level modulation maintained. TVI-shielded cabinet. Pi-Net output on 10-80M, Link-coupled on 6M, matching into low impedance beams. New type, wide view shielded meter. Kit contains all parts, tubes, pre-punched chassis and complete manual.

Power Booster PB-1



Wired: **$21.95**
Kit Form: **$14.95**

For straight through operation on 6M (Scout 680A or 680 only; plugs internally into Globe Scout). Approx. 50% more power output, while attenuating harmonics and further suppressing TVI.

Hybrid, 5⅜x15⅝x9

Globe Patcher

New phone patch, operates VOX on SB, Push-to-talk on AM, with all popular Amateur Eqpt. Switchable selection 500-8 or 3.2 ohm speaker. Simple to install, operate. Balance control. Standby switch for landline call without energizing the Xmttr . . . Completely shielded.

Mounts Anywhere!

Complete! wired, only **$29.95**

Visit Your Favorite Distributor for Details!

OTHER TOP FLIGHT GLOBE PRODUCTS

Globe King, wired **$795.00**; Globe Chief, w/t: **$74.50**, kit: **$59.95**; Hi-Bander, w/t: **$149.95**, kit: **$129.95**; VFO 6-2, w/t: **$59.95**, kit: **$49.95**; Power Attenuator, w/t: **$10.95**; Plate Modulator UM-1, w/t: **$49.95**, kit: **$32.50** (less tubes); Screen Modulator Kit, **$11.95**; 6-Meter Converter 6PMC, w/t: **$29.95**, kit: **$21.95**; Speech Booster, w/t: **$24.95**, kit: **$15.95**.

GLOBE electronics
3417 W. BROADWAY
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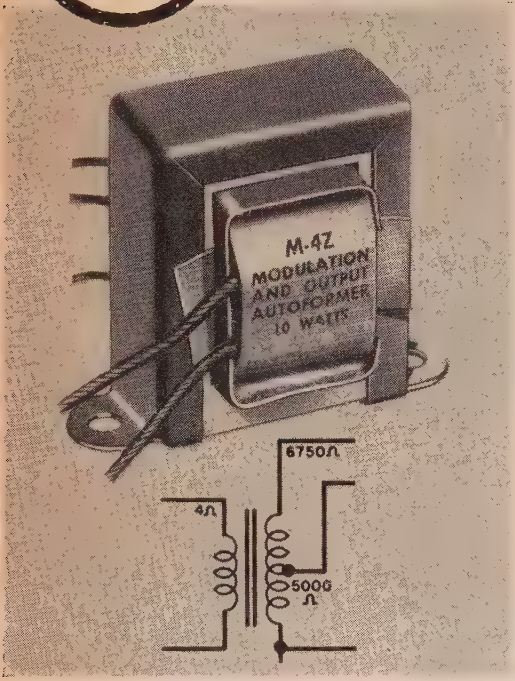
For further information, check number 13 on page 126.

TRANSFORMER NEWS FROM TRIAD



M-4Z Transformer
Ideal for new Citizen's Band

The recent FCC decision to open the 11-meter band for citizen's band operation now makes it possible for any U.S. citizen over 18 to own and operate a transmitting and receiving station. No radio license necessary!

Triad's M-4Z transformer is designed especially for amateur use. It's compact, highly efficient, a remarkable performer. Only $3 at your Triad distributor. Ask him for complete information or write to us.

Primary impedance	5000 Ω and/or 6750 Ω
Secondary impedance	4 Ω
D.C. primary	100 ma
Audio	10 watts
Weight	12 ounces

TRIAD

TRIAD TRANSFORMER CORPORATION
4055 REDWOOD AVENUE, VENICE, CALIFORNIA
A DIVISION OF LITTON INDUSTRIES

For further information, check number 14 on page 126.

mittee was formed. These are the people who make the decisions with respect to frequency users. We (The WIA) are the only group in this country representing the amateurs. While we have gained a seat on this committee, we hav done so without any voting power. We attended meetings dealing with discussions on those parts of the frequency spectrum of concern to amateurs, and, as anticipated, found that certain representatives tabled motions for frequency cuts on some of the amateur bands. As far as we know, the remainder of the bands will stay as they are. We put up powerful arguments against these proposals but in the end the chairman put the motions to a vote from the committee and we lost out on each count That's briefly it! These proposals have been forwarded to Geneva, but as we are led to believe, they are ONLY PROPOSALS and may never get through the Geneva Conference.

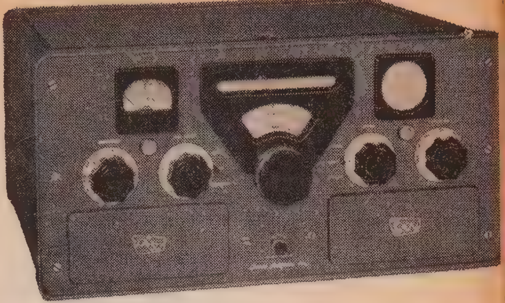
"I am afraid, Wayne, that the commercials have little interest in the future of Amateu Radio. Especially when frequencies are involved. Like your country, Australia derives the benefit of the amateur in employment, but such important things as 'where the future engineers and technicians will come from' are quickly forgotten when the commercial interests are after more frequencies. It gets right unde my skin to listen to the 'miles' of frequencies either with no audible signals or all cluttered up with shortwave broadcasting (to which a minority of the world's population listens), useless jamming stations, and all sorts of other noise producing and seemingly worthless transmissions. And yet they want more frequencies . . . frequencies to be taken from our bands which already carry a channel density and per kilocycle density which the commercials wouldn't tolerate, let alone be able to operate. It's a shame, if you'll excuse my saying so, and it's time the whole world of amateur radio was made aware of the facts as they really stand. It's certainly worth every single cent to send representatives to Geneva. Even if they cannot officially speak, their very presence must be a deterrent to governments who might otherwise just forget the amateur service ever existed. I tell them over here that we are officially listed in the minutes of the ITU as a service, and as such we have every right to have a say . . . and a powerful say at that . . . in our own affairs.

"To this end the Federal Executive of this Institute, of which I am currently president, made a firm decision way back that we should send a representative to the next conference with or without official accreditation from our government. We set about the task and were successful in having our representative officially accredited as a member of the Australian Delegation, although we are told he cannot speak at the conference. However, our man is going and under the regulations of the Atlantic City minutes, we are of the opinion that our man can speak at the conference with the permission

NOW IN FULL PRODUCTION!

THE REVOLUTIONARY NEW CENTRAL ELECTRONICS 100V EXCITER-TRANSMITTER

BROADBANDED! ONLY ONE TUNING CONTROL, THE VFO ITSELF.



CENTRAL ELECTRONICS, THE PIONEER OF AMATEUR SSB IS PROUD TO BRING YOU THE FINAL RESULT OF THREE YEARS OF THE KIND OF PATIENT ENGINEERING, TESTING AND IMPROVING THAT MAKES FOR A SUPERIOR PIECE OF ELECTRONIC GEAR.

MANY OF THE TRIED AND TRUE PRINCIPLES AND FEATURES OF THE ORIGINAL MULTIPHASE EXCITERS HAVE BEEN RETAINED IN THE NEW 100V, ALTHOUGH IN VASTLY IMPROVED FORM. THE USE OF PATENTED BROADBAND CIRCUITRY THROUGHOUT PRACTICALLY ELIMINATES "COCK-PIT" TROUBLE.

REGARDLESS OF YOUR PREFERRED MODE OF OPERATION, IT'S ALL IN THE 100V. SSB, DSB, AM, PM, CW and FSK . . . AND ALL AT THE FLIP OF ONE SWITCH. ALTHOUGH THE 100V WILL PROBABLY FIND IT'S GREATEST USE AS A SINGLE SIDEBAND SUPPRESSED CARRIER EXCITER-TRANSMITTER . . . NO ONE HAS BEEN "LEFT OUT IN THE COLD" IN IT'S DESIGN. THIS IS THE KIND OF A RIG THAT HAMS DREAM ABOUT!

CHECK AND COMPARE THESE FEATURES

STABILITY: The new patented two tube permeability tuned VFO circuit is exceedingly stable and is immune to the effects of line voltage fluctuations and tube ageing. Built like a battle ship, it is tuned by a husky precision lead screw assembly running in ball bearings. This is a VFO to end all VFO's.

FREQUENCY COVERAGE: 80 METERS — 3.5 to 4.5 Mc. 40 METERS — 6.5 to 7.5 Mc. 20 METERS — 13.5 to 14.5 Mc. 15 METERS — 20.5 to 21.5 Mc. 10 METERS — 27.7 to 29.7 Mc. A spare X position provides for the installation of broad-band coils for 160 meters, MARS, etc. OR any 1 Mc. portion of the spectrum between 1.5 Mc. and 25.5 Mc. OR any 2 Mc. portion of the spectrum between 25.5 Mc. and 29.7 Mc. YOU DON'T SETTLE FOR HALF A LOAF OF FREQUENCY COVERAGE WHEN YOU HAVE A 100V!

THE TUNING DIAL: Band scales in the large slide rule window change with the band switch and are calibrated at each 100 KC point. Frequency is read directly in 1 KC increments by the circular KC dial without any computation whatever. Approx. 12 feet of bandspread on each band. A smooth running two-speed tuning knob allows fast tuning at 100 KC per turn and slow tuning at 750 CYCLES per turn. Calibration accuracy is 250 cycles between any two 50 KC points.

METERING: Reads POWER INPUT (0-200 watts) RF AMPS OUTPUT, AC LINE VOLTAGE and CARRIER SUPPRESSION IN DB DOWN TO 70 DB.

MONITORING: A 2" scope provides an instantaneous visual check on non-linearity resulting from improper loading. Also indicates proper setting of carrier injection for 100% AM modulation. Scope presents trapezoid pattern.

OTHER INDICATORS: Below the meter a neon indicator provides a check on the operation of the NEW AUDIO LIMITER CIRCUIT. Below the scope a second neon indicator starts operating if you have the antenna or load mis-matched.

NEW AUDIO FILTER-LIMITER: The new filter is composed entirely of R-C components, yet has the steep side response and rejection characteristics of a four toroid tuned filter but without the usual harsh, ringing effects. Bandpass is 200 to 3700 cycles. This filter precedes the phase shift system and will maintain 50 DB SUPPRESSION OF THE UNWANTED SIDEBAND. The new audio limiter maintains audio drive to the balanced modulator WITHIN 1 DB, REGARDLESS OF HOW HARD THE MIKE IS HIT. IT'S IMPOSSIBLE TO OVERDRIVE THE 100V BALANCED MODULATOR! Inverse feedback circuits allow 10 DB OF CLIPPING with negligible distortion.

NEW PS-2 AUDIO PHASE SHIFT NETWORK: A twelve cross-over point network is composed of heat-cycled components having .1% accuracy. Even changing the balanced modulator tubes has no effect on it's maintaining 50 DB OR BETTER suppression!

POWER OUTPUT: The husky, ultra-linear type 6550 tubes in the final of the 100V will deliver 100 WATTS OF SINGLE TONE POWER, EVEN ON TEN METERS! AND WITHOUT GRID CURRENT FLOW. Two tone third order distortion products are down in excess of 40 DB. A new POWER OUTPUT CONTROL eliminates the need for power dividers when driving AB1 or AB2 linears, since power output is continuously variable from 10 watts to full output.

SET AND FORGET CONTROLS: These seldom used controls are all located behind the flip down magnetic doors on the front.

GENERAL CIRCUITRY: Crystal controlled master SSB generation is at 8 MC. VFO injection is 5 to 6 MC. Crystal controlled heterodyne oscillators operate into mixer stages for various bands. This system, originally developed by C. E. is today the standard of the industry. Blocked grid keying of mixers and final amplifier provides perfect CW and PHONE BREAK-IN.

PHYSICAL DATA: Panel is standard 19" width by 8¾" high. Finish is smooth grey. Attractive heavy duty rounded corner cabinet is 15" deep, is finished in grey wrinkle and has a latch type access lid. Shipping weight approx. 90 lbs.

MULTIPHASE 100V complete............................ Amateur net............................$595.00

Easily removed from the cabinet for rack mounting.

COMING UP! MORE SUPERIOR GEAR FROM C. E. THE SSB PIONEER

A NEW COMPANION RECEIVER: Which will TRANSCEIVE THE 100V or separate the two VFO's at the flip of a switch. The 100V has the interlock control sockets built in.

A NEW 2500L BROADBAND LINEAR AMPLIFIER. Big brother to the famous 600L.

A NEW HETERODYNE CONVERTER: To cover all of the 2 and 6 meter bands with the 100V. Interlock control sockets are in the 100V.

For further information, check number 15 on page 126.

MULTIPHASE
EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois

A subsidiary of Zenith Radio Corp.

WRITE FOR
LITERATURE ON
THE COMPLETE
MULTIPHASE

A NEW CONCEPT- Hi-Power
VHF LINEARS for 6 or 2 meters

**Watts DC Input: 600 on SSB-CW-FM;
300 on AM-PM**

• New BROADBAND untuned input circuit uses 6-watt drive for 600-watt input; for 50-70 ohms. • New output circuit gives approximately 20 db more harmonic suppression than any other in common use while matching antenna impedances between 25 and 300 ohms. • New built-in TR switch uses gain and selectivity of output tuned circuit; has approximately 10 db gain, with one 12BH7A tube.

Excellent stability; No parasitics; TVI suppressed. Bypassed RF final in shielded compartment. Designed to work with 600A, 200A, Gonset Communicators, etc.

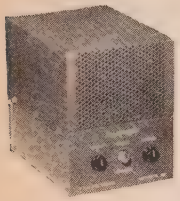
• Built-in heavy-duty power supply furnishes 2000 volts at 350 ma.; excellent static and dynamic regulation. • Forced-air cooled PL4D21A in class AB2; up to 60% efficient. • 6 db switchable attenuator for AM-PM (tune for max. input and output . . . just switch in attenuator). • 3-position meter reads: (1) RF drive voltage input (tune exciter for max. input); (2) Final plate current (shows dc input to final); (3) instantaneous RF amps output (tune for max. output into antenna).

Special frequencies available on request.

Choice of grey table model (14½x10½x8¾ in.) or grey or black rack models. Ship. wt. 50 lbs.

L600M or L200M . . . tentative amateur net. $289.95

Six Meter Transmitting Converter



A new heterodyne unit ideal for any low powered 14 to 18mc transmitter or exciter such as 20A, 10B, DX20, DX35, etc. Uses a 6U8 operating as 36mc crystal controlled oscillator amplifier and has an 0A2 voltage regulator. A 6360 linear mixer amplifier in the output is tunable between 49 and 55 mc. Low impedance input of approximately 60 ohms; delivers up to 10 watts RMS output into any low impedance load between 25 and 100 ohms. Powered by separate power supply or in some cases by transmitter or exciter such as 20A or 10B. Requires 300 volts at 100 ma dc, 150 volts negative bias and 6.3 volts at 1.5 amp filament. Size only 5x7x7 inches.

Model 600A Complete, less Power Supply. $49.95
Model PR 600A Power Supply for above 39.95
Model 600A-PR Complete with Power Supply 87.50

LA-400 Series Linears—75 thru 10 meters
LA-400-C Kit, complete for assembly. . . . . . .only $149.95
LA-400-B, same unit wired and tested. 199.95

V-F-O-MATIC Frequency Control
8020 for 75A-2, -3, -4 Collins receivers. $129.95
8010 for KWS-1 75 thru 15 . . . . 179.95

High Power RF Choke—Model 160-6
Max. rating of 5000 volts dc at 2.5 amps. Inductance 162 uh at 1 kc. Operates on all amateur bands, 160 thru 6 meters. Each $3.50

Also chokes custom designed to your requirements.

See your distributor or write:

P & H ELECTRONICS, INC.
424 Columbia, Lafayette, Ind.

For further information, check number 16 on page 126.

of the Chairman of the conference or workin group in session at the time and the sanctio of his government. How well this can be dea with will depend upon the man we send an in this regard, we feel we have the best ma in Australia for the task."

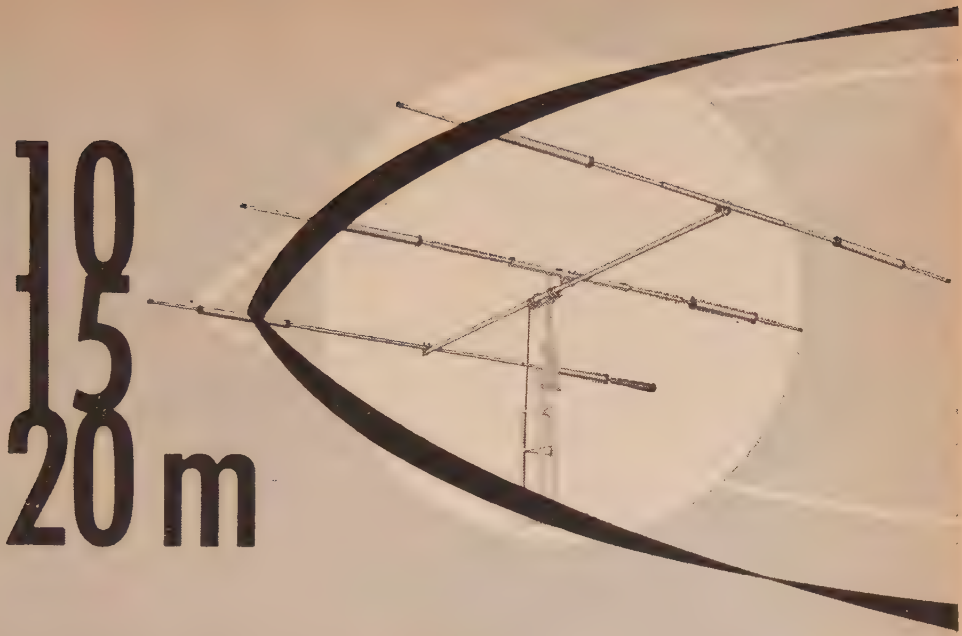
"It is most gratifying to know that you hav the amateur service so much at heart and tha you are prepared to assist in protecting it. W have the right to fight our case, and a fe governments will have to awaken to the fac that the amateurs mean business." Good Luck

Motorola VHF Proposals

The FCC, these days, is listening to opinio from all interested parties about re-allocatin the VHF's (Docket 11997) from 25 *mc* to 89 *mc*. Just to let you know that the commerci users of frequencies are not relaxing quite th way we are, here is the proposed allocatio plan put forth by Motorola before the FCC Notice that six meters and 220 *mc* are eliminated, while two meters is moved and cut bac by the space communications systems th would share the frequencies. Also rememb that there is every possibility that all amateu frequencies above 220 *mc* will probably hav to operate under the present non-interferen basis with extremely high power radar install tions.

25-50	*mc* would be unchanged. (Ten Met Band)
50-72	*mc* recommended for land Mobi (*Eliminates* 6 meter band)
72-76	*mc* for Amateur on non-interferen basis to 75 *mc* marker beacon
76-88	*mc* for Government
88-108	*mc* for FM Broadcasting
108-136	*mc* for aeronautical
136-138 -	*mc* for Space Communications an amateur radio on non-interferen basis.
138-140 -	*mc* for amateur (In place of prese 2 mtr band 144-148 *mc*.)
140-166	*mc* for land mobile (Currently 15 174 *mc*.)
166-174	*mc* for Government
174-354	*mc* for Television (*Eliminates* 220 AMATEUR band)
354-394	*mc* for Government
390-392	*mc* for Space Communications
392-400	*mc* for Glide Path
400-406	*mc* for Radio Sonde
406-420	*mc* for Non-Government Telemete ing
420-450	*mc* for AMATEUR
450-489	*mc* for Land Mobile
489-490	mc for Non-Government Telemete ing
490-790	*mc* for Government
790-800	*mc* for Space Communications
800-875	*mc* for Common Carrier :
875-889	*mc* for Operational Fized
889-890	*mc* Non-Government Telemetering

Way



MOSLEY TRAPMASTER BEAMS

Streamlined grace combines with the look of rugged strength to make **MOSLEY** Trap Master Antennas pleasing to the eye and completely acceptable to your neighbors.

Trap Master Antennas *perform*, too . . . thousands of Amateurs in the U.S.A.—and almost every corner of the globe—are glad *they* bought a **MOSLEY** Trap Master!

(Illustrated, is the world-famous TA—33. Rated to maximum legal power, this 3 element beam performs wonderfully on 10, 15 and 20 meter bands. Factory pre-tuned for quick, easy assembly without tedious measuring. AMATEUR NET, $99.75)

AT YOUR FAVORITE AMATEUR EQUIPMENT DEALER

Mosley Electronics, Inc

8622 St. Charles Rock Road • St. Louis 14, Mo.

Export Department: 15 Moore St., New York 4, N.Y.

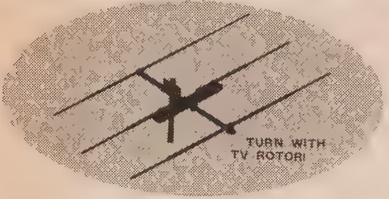
For further information, check number 17 on page 126.

NEW!

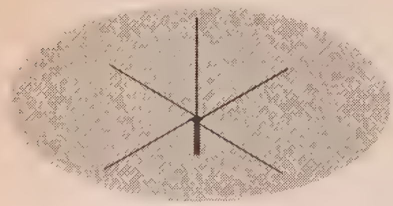
Citizens Band Antennas

Mosley 27 mc. Antennas are practically maintenance-free!

Rugged . . . Durable!
100% Rust Proof!
*100% Corrosion Proof!**
Stainless Steel Hardware!
61ST6 Heavy Gauge Aluminum!
*When Mosley Antenna Coat, supplied, is used as directed.



MODEL A-311, Three Element Beam for best point-to-point communication. 9.3 db gain over reference dipole.
Net Price $37.50



MODEL V-27-GP, Ground Plane Vertical for effective communication with mobiles.
Net Price $34.95

Catalog Sheet on request.

Mosley Electronics, Inc.
8622 ST. CHARLES ROCK ROAD
ST. LOUIS 14, MISSOURI

For further information, check number 18 on page 126.

Feenix, Ariz.

Deer Hon Ed:

Getting out the Hon. Brass Band and shining up the Hon. Luffing Cup—Scratchi are doing it again. Yes indeedy, Hon. Ed., amchoors all over country will be ereckting bronze statchyous to Hashafisti Scratchi when they heering my latest boon to amchoor radio.

Are planning to running big advertisements in your Hon. Mag., but are figyouring that better telling you all abouts idea, on acct. will be needing to putting Hon. Ads on the cuff until getting first cupple thousand bux.

In fackly, that are what giving me the idea—I are broke. Being broke, figyouring that better getting idea for making some bux. Also figyouring that most other amchoors being broke also, and if going to selling something to other amchoors, better having something that not costing much monies.

Also needing to selling something that all amchoors are wanting or are needing. It also being reel slicky if amchoors not having what they needing or wanting, if you are following me, Hon. Ed. If you are following me, Hon. Ed., then I thinking you thinking that Scratchi can't thinking of anything that all amchoors are needing but not having and which costing practically nothing.

Well, Hon. Ed., you can unfurrow your brow. Scratchi will reveel all. Giving up? It are reel 1/c Conelrad monitor.

Are all amchoors needing it? Yes indeedy, unless Hon. F.C.C. are just riting rules for Hon. Fun of it. Okay on point one.

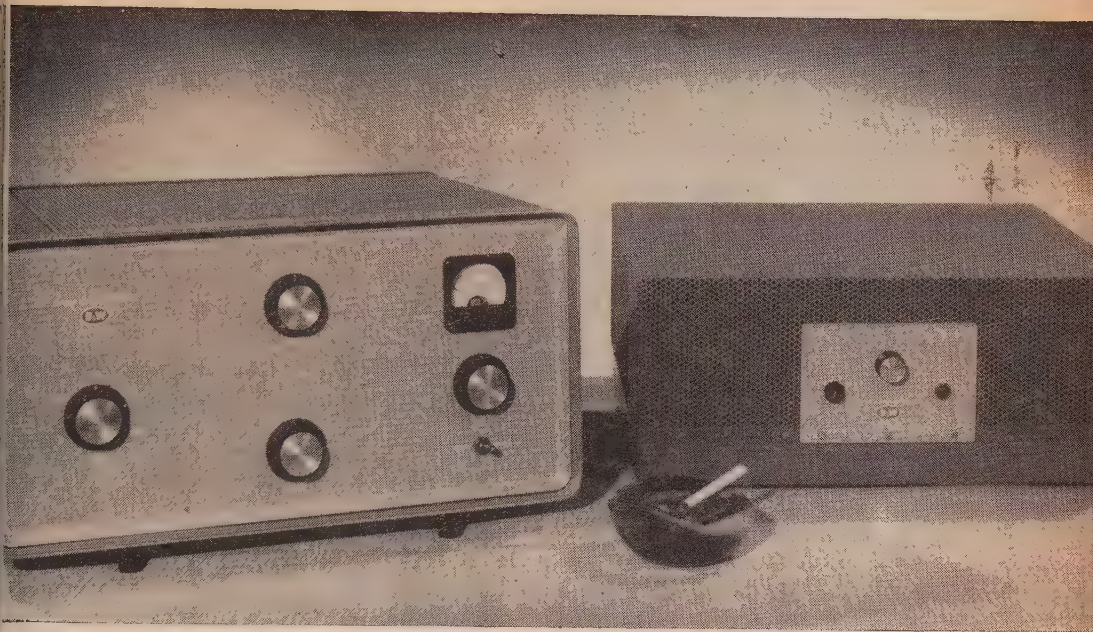
Are all amchoors not having one? Let's putting it another way. How many amchoors you knowing that having one? Okay? Okay on point to.

How about not costing much monies? The S.C.M. (Scratchi's Conelrad Monitor) are costing for-bits PP. (That PP meening that Scratchi getting stuck for Hon. Postage). You thinking I selling many at for-bits? Natchyourally. Okay on point three.

In fackly, if can selling to one-hundred thousand amchoors, taking in fifty thousand bux, and if S.C.M. are costing me to-bits, then I netting twenty-five thousand bux. Hon. Ed.,

[*Continued on page 61*]

POWER...
PACKAGED FOR TODAY'S AMATEUR



LPA-1 GROUNDED GRID LINEAR AMPLIFIER
NET PRICE $375.00 COMPLETE WITH TUBES

LPS-1 POWER SUPPLY
NET PRICE $205.00 COMPLETE WITH TUBES

Power—a full kilowatt with this smartly designed, excellently styled version of the famous B&W linear amplifier family! New compactness . . . takes up no more space on your table than a receiver. New features . . . for greater performance and flexibility than ever before.

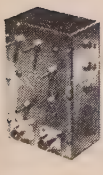
Separately housed LPA-1 R. F. section employs two Type 813 beam power tetrode tubes, connected as high-Mu triodes in a grounded-grid circuit. Blower, filament and bias supply are included in this section.

High voltage power supply unit LPS-1 may be remotely located. Switching control panel is removable for convenient installation at the operator's location. Circuit consists of a full wave single phase bridge rectifier, using four Type 816 mercury vapor rectifier tubes. R. F. filtering protects tubes and prevents mercury vapor hash radiation.

The LPA-1 can be driven by most exciters in the 100 watt class, such as the B&W 5100/5100B series, Vikings 1 and 2, Valiant, Collins 32V, KWM-1, 32S-1 series, Heath DX100 and others.

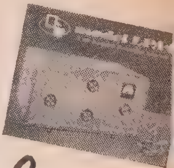
A compact impedance matching unit, the B&W LPA-MU, is separately available. It provides for operation with fixed output exciters such as the Hallicrafters HT 32 Series and similar types. A similar unit, the LPA-MU-2, is also available for use with the B&W L-1000-A and L-1001-A.

Your local distributor should have these advanced units *now* . . . see them soon.



LPA-MU MATCHING UNIT
LPA-MU-2

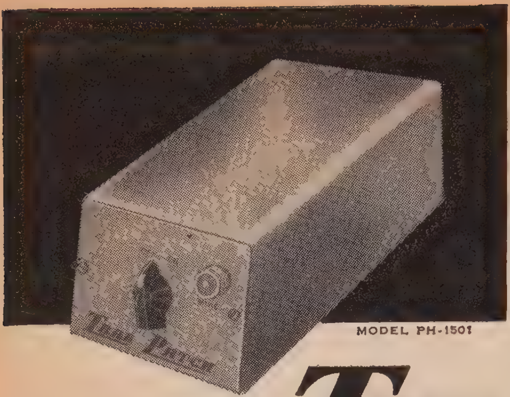
Send for this illustrated brochure in full color giving specifications and detailed descriptions of the new B&W LPA-1, LPS-1 and LPA-MU.



Barker & Williamson, Inc.

Canal Street and Beaver Dam Road • Bristol, Penna.

HER B&W AMATEUR EQUIPMENT: Transmitters AM-CW-SSB • Single Sideband Generators • Single Sideband Receiving Adapters • Dip Meters • Matc
asters • Frequency Multipliers • Low-Pass Filters • T-R Switches • R.F. Filament Chokes • Transmitting R.F. Plate Chokes • Audio Phase Shift N
Band Switching Pi-Networks • Cyclometer-type Counters • Antenna Co-axial Connectors • Baluns • Variable Capacitors • Fixed an



New **TRAD PATCH**

The Patch developed by an Active Ham (K2GIK) for the AVERAGE HAM.

EASY TO OPERATE
EASY TO INSTALL
EASY TO OWN!

FEATURES:

- Switchable selection of 500, 8, or 3.2 ohms to match your speaker terminal connections
- No additional transformers necessary
- One-switch operation
- On-off switch permits placing phone call without energizing transmitter
- Completely shielded, filtered and RF by-passed to eliminate RF feedback
- Amphenol mike input connector on front panel
- Compact aluminum cabinet, finished in gray hammertone enamel

Will match your equipment and fit anywhere. Completely wired and tested.

Only **$14.95** POSTPAID IF CASH WITH ORDER

ORDER YOURS NOW

TRAD ELECTRONICS CORPORATION
1001 FIRST AVENUE • ASBURY PARK, N. J.

TRAD ELECTRONICS CORP.
Asbury Park, N. J.

Please rush TRAD PATCH

☐ Enclosed is $14.95 in full payment, including postage

☐ Enclosed is $4.95. I will pay postman $10 plus postage upon receipt

Name ______

Address ______

______

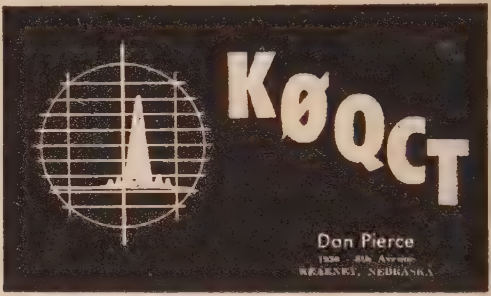
Call ______

For further information, check number 20 on page 126.

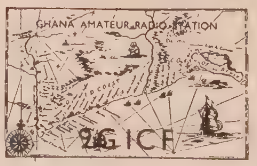
QSL contest

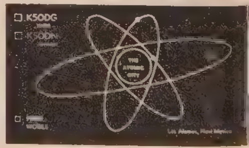
The panoramic presentation of Dan Pierce, KØQCT takes the honors for June. Dan's efforts on this striking example of printing mischief also earn twelve more issues of CQ. The card is glossy black, call letters, lettering and scope signal in bright green and scope graduations in sharp white. Oh! for full color reproduction. Runners up may have to renew their subscriptions but still win heaps of fame: W7PFW, XEOAU, (W2WK), 9GICF and K5ODN.

WINNER



LOSERS





For Hams who TRAVEL
. . . live in APARTMENTS

the New MOSLEY

Tote-Tenna

for 10-15-20
works GOOD anywhere!

here's why: TOTE TENNA is a full electrical ½ wavelength on each of the 3 bands and is voltage fed through a frequency-sensitive *tunable* L network. This makes it possible to tune out reactance and achieve near-unity match under almost every conceivable condition of installation. High in the air—or near the ground . . . **TOTE TENNA will put your signal out!**

Superb engineering and craftsmanship make the TOTE TENNA a perfect traveling companion to the finest in portable/mobile rigs. Rated to 300 watts (AM), TOTE TENNA is also ideal as a "fixed station" antenna for low and medium power operation.

TOTE TENNA radiator opens to 14' . . . packs into space just 4½" x 8" x 36". Truly portable! Sturdy window mount is quickly, easily installed without tools. Weather seal keeps out wind or rain so you can "ham" in comfort — *anytime!*

Radiator sections, of durable 61ST6 aluminum, are ingeniously connected by an interior spring and nylon cord arrangement that permits rapid and accurate assembly. No ground or radials are needed. You're on the air in *minutes* with TOTE TENNA!

MODEL TT-31, TOTE TENNA with Tuning Unit, Coax Line & Window Mount. Amateur Net, $80.00

MODEL TT-31-A, Deluxe Carrying Case. Amateur Net, $27.45

MODEL RI-6, *SWR Bridge. Amateur Net, $47.65

MODEL TT-31-X, TOTE TENNA complete with all accessories listed above. Amateur Net, $149.50

*(Because TOTE TENNA is designed to be tuned for peak performance in varying locations, this can best be accomplished by tuning for lowest SWR. The MOSLEY Model RI-6 is a superior quality instrument featuring a side indicator meter and intended for continuous service at power ratings from 10 watts to 1 Kw. For 52 ohm line.)

Mosley *Electronics, Inc.*

8622 St. Charles Rock Road • St. Louis 14, Mo.

For further information, check number 21 on page 126.

THE ONE MICROPHONE THAT IS A SYMBOL OF AMATEUR RADIO THE WORLD OVER

For more than two decades the ASTATIC D-104 has been top choice of ham operators everywhere

AND NOW

ASTATIC BRINGS YOU 2 NEW MIKES DESTINED TO BECOME EQUALLY FAMOUS IN SINGLE SIDE BAND TRANSMISSION THE MODEL 10-C CERAMIC AND 10-D DYNAMIC

You'll prefer the 10-D or 10-C for their more intelligible signal, higher talk power, tailored response, less splatter, greater attenuation of unwanted side band.

MODEL 10-D RECOMMENDED FOR USE WITH HT-32.

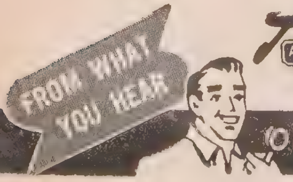
Model	Net Price	Model	Net Price
10-C	$17.82	10-D	$23.82
G10-C*	$29.94	G10-D*	$35.94

*Complete with G-stand

For complete information write for Astatic Microphone Catalog.

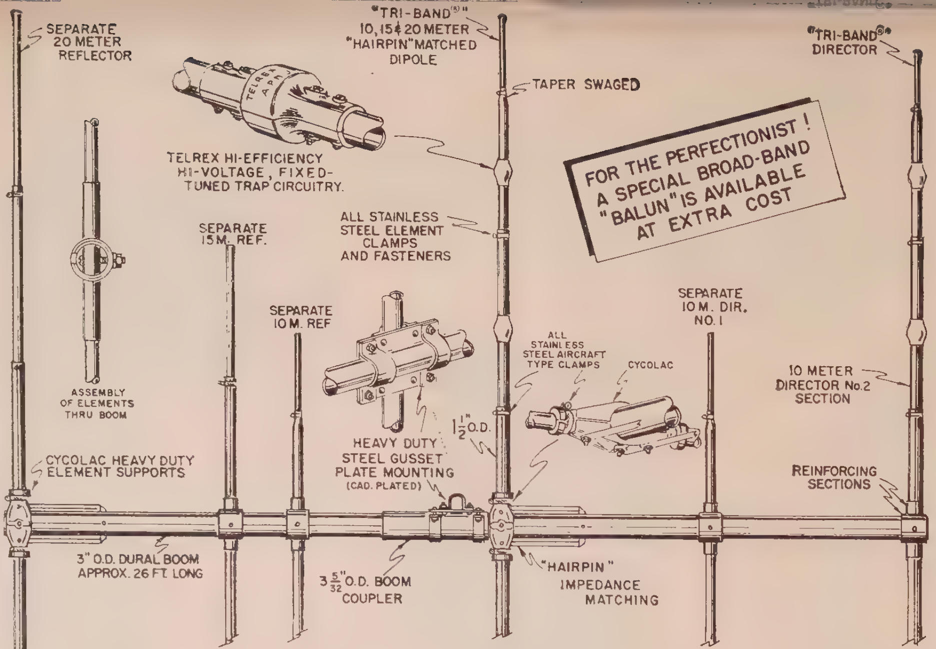
THE Astatic CORPORATION • CONNEAUT, OHIO

In Canada: Canadian Astatic Limited, Toronto, Ontario
Export Sales: Roburn Agencies Inc., 431 Greenwich St., N.Y. 13, N.Y.
U. S. A.

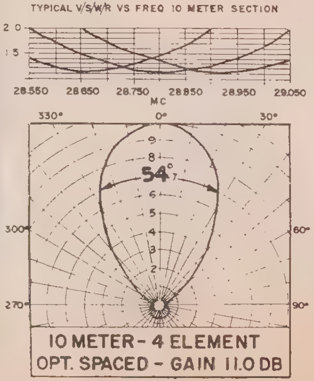


SUPERIOR ENGINEERING IS TYPICAL OF THE COMPLETE ASTATIC MICROPHONE LINE

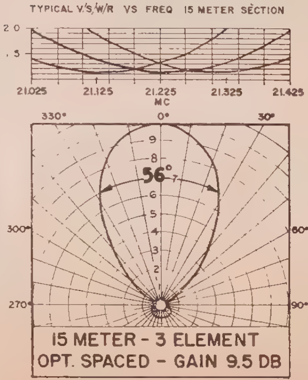
For further information, check number 22 on page 126.


SEPARATE 20 METER REFLECTOR
"TRI-BAND®" 10, 15 & 20 METER "HAIRPIN" MATCHED DIPOLE
"TRI-BAND®" DIRECTOR
TAPER SWAGED
TELREX HI-EFFICIENCY HI-VOLTAGE, FIXED-TUNED TRAP CIRCUITRY.
ALL STAINLESS STEEL ELEMENT CLAMPS AND FASTENERS
SEPARATE 15M. REF.
SEPARATE 10M. REF
SEPARATE 10M. DIR. NO. 1
ASSEMBLY OF ELEMENTS THRU BOOM
ALL STAINLESS STEEL AIRCRAFT TYPE CLAMPS
CYCOLAC
10 METER DIRECTOR No. 2 SECTION
$1\frac{1}{2}$" O.D.
HEAVY DUTY STEEL GUSSET PLATE MOUNTING (CAD. PLATED)
CYCOLAC HEAVY DUTY ELEMENT SUPPORTS
REINFORCING SECTIONS
3" O.D. DURAL BOOM APPROX. 26 FT. LONG
$3\frac{5}{32}$" O.D. BOOM COUPLER
"HAIRPIN" IMPEDANCE MATCHING

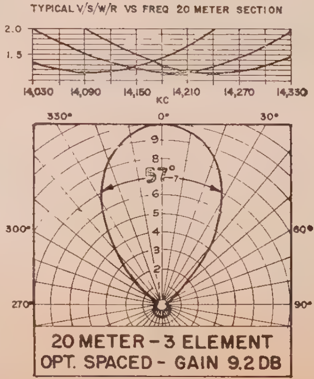
FOR THE PERFECTIONIST !
A SPECIAL BROAD-BAND
"BALUN" IS AVAILABLE
AT EXTRA COST



10 METER - 4 ELEMENT
OPT. SPACED - GAIN 11.0 DB



15 METER - 3 ELEMENT
OPT. SPACED - GAIN 9.5 DB



20 METER - 3 ELEMENT
OPT. SPACED - GAIN 9.2 DB

TELREX MONARCH
"TRI-BAND"® Model TBS-626

Amateur Net 259^{75} F.O.B. Asbury Park
New Jersey

KING...of all Single-Transmission-Line Arrays!

Telrex . . . tuned, matched, and calibrated, for easy assembly (to your favorite band sectors) and specified Telrex performance at your site . . . without tuning or adjustments of any kind required or recommended! Model TBS-626 consists of 6 optimum spaced elements (two of which are "Tri-Band®" elements) on a 26 ft. boom, providing optimum 4 element 10 meter and optimum 3 element 15 and 20 meter performance. Separate, properly spaced, reflectors, provide optimum F/B ratio on the 3 bands with no gain degradation!

Model TBS-626 is destined to become a classic, and is engineered to provide maximum performance and satisfaction per dollar, per element. No finer single-transmission-line "Tri-Band®", is possible! The following specifications, patterns, and V/S/W/R curves tell the complete story:

V/S/W/R at resonant point (using 50 ohm coax) 1.1:1
V/S/W/R bandwidth within 2:1........1.5%
F/B ratio on 10, 15 and 20 meters .. 28 DB
Max. power rating .. 3KW 100% AM
Boom length and diameter ..... 26 ft. x 3" O.D.
Longest element length ... 34 ft.-6" approx.
Turning radius approx. .... 20 ft.

Support mast required 2" O.D.—Seamless .125 wall min.
Wind surface area . 9.50 sq. ft.
Wind load at 100 m.p.h. .. 300 lbs.
Recommended rotator—Telrex Models 500-RIS or 175B
Design wind load rating with ½" radial ice load—110 m.p.h.
Antenna net wt.-77 lbs.—Shipping wt. approx. 92 lbs.
Shipping container size approx. ....12"x12"x14 ft.

NOTE:—Also available, lower cost Telrex "Tri-Band®" arrays, designed to out-perform and out-last any so-called Tri-Bander on the market today! Order with confidence or send for data sheet of model in which you are interested:

CHALLENGER SERIES TBS-416............................ **$159.50**
4 Element (16'x2"O.D. Boom) gain 8 db. Recommended Rotator—Telrex 175B

CHALLENGER SERIES TBS-308................................ **$99.75**
3 Element (8'x2"O.D. Boom) gain 5 DB. Recommended Rotator—Telrex 175B or CDR

CHALLENGER SERIES DTB-30.............................. **$38.50**
Rotatable 10, 15 and 20 Meter "Tri-Band®". Dipole, unity gain—bi-directional pattern. Any good TV rotator may be used.

141 MODELS TO CHOOSE FROM—$5.95
TO $590.00, ¾ METER TO 40 METERS

ANTENNAS SINCE 1921 **Telrex** LABORATORIES
Communication and TV Antennas
ASBURY PARK 25, NEW JERSEY, U.S.A.

For further information, check number 23 on page 126.

"HAM-M" ROTOR by CDR

Install in any type of tower

COMPLETE PACKAGED SYSTEM.

Nothing else to buy. Can be installed atop *any* tower, and inside most towers.

EXTREMELY RUGGED.

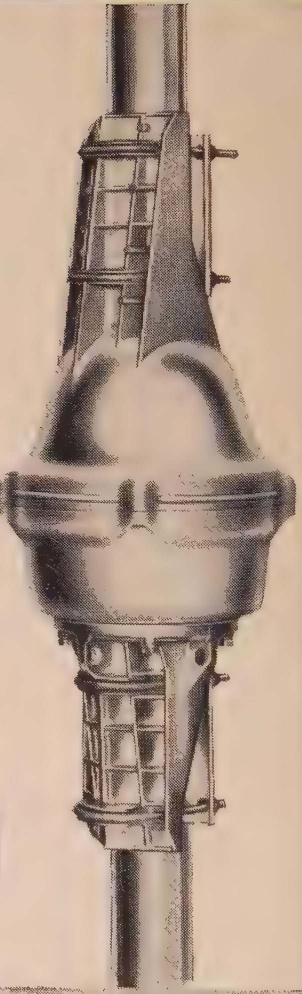
Extra heavy-duty. Thousands of "Ham-M" rotors are now in operation in every kind of climate, rotating every conceivable antenna combination. "Ham-M" is wind-proof, ice-proof, moisture-proof! Won't drift. Provides 3500 in.-lb. resistance to lateral thrust.

FIELD KITS FOR EASY INSTALLATION.

North-Center Meter Scale kit. Base plate for internal tower mounts. Anti-meter flutter kit. Mounts on shaft or flat on plate in 30 minutes.

WHY PAY MORE?

"Ham-M" is the pet of hams from coast to coast—and for good reasons! "Ham-M" gives better performance...holds heaviest antennas...stands up against the elements far better than other rotors, yet COSTS LESS! See "Ham-M" at your distributors: only $119.50



EXCLUSIVE OFFER: CDR "CALL-LETTERS" JEWELRY FREE! Handsome rhodium-finish tie-bar and key chain, both with your call-letters engraved FREE with your purchase of the "HAM-M." Both bear amateur radio emblem. Just *examine* the "HAM-M" and get both for only $3.60 (tax included), a $7.20 value for half price. See your CDR distributor for details.

CDR

HAM ANTENNA ROTOR

Cornell-Dubilier Electric Corp.,
South Plainfield, N. J.

The Radiart Corporation,
Indianapolis, Ind.

For further information, check number 24 on page 126.

HEAVY DUTY
MOBILE BASE MOUNTS

NEW!

Ebony Finish $6.95	Polished Finish $7.95
Ebony Finish, S. S. Hardware.	$8.95
Polished Finish, S. S. Hardware	$9.25

NEW MULTI-BAND ANTENNA COILS

New *Plug-In* type coils for the Ham, designed to operate with a standard 3′ base section and standard 5′ whip

No. 999
10-15-20 METERS

YOUR CHOICE
$14.95

No. 900
10-15-20-40-75 METERS

- Rigidly tested & engineered—found to have "Q" of 525
- Handles 500 Watts input
- Operates into a 52-ohm cable
- Positive contact—noisefree, troublefree operation
- Weathersealed
- Factory pre-tuned—no adjustments needed

NEW! SLIM-JIM
ALL-BAND BASE LOADING ANTENNA COIL

96″ WHIP

FOR 10, 11, 12, 15, 20, 40, 80 METERS

SIZE
1⅜″ x 19″

NO. B-1080

Positive action, just slide whip in or out to loading point and lock nut into position.

$17.95

PROTECTS YOUR MOBILE ANTENNA

NEW HEAVY DUTY MOBILE SPRINGS

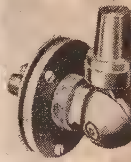
MMW-7 Cad. plated, black painted ends $4.50

MMW-7HC Heavy Cad. plated—Ex Protection $5.50

MMW-7SS Deluxe Stain. Steel $8.95

Leaders in the Design and Manufacturing of Mobile Communication Equipment & Antennas

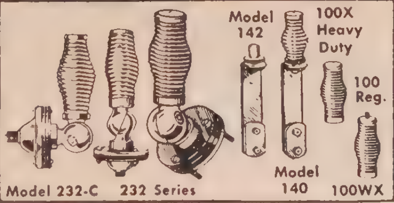
No. 321
BODY MOUNT
$7.95



Automatically tunes the entire band from the drivers seat!

MASTER MATCHER & FIELD STRENGTH METER

6 or 12 volt models **$24.95**



MASTER-MAGIC WAND

New easy-to-install, single band, top-loaded plastic covered fiber glass mobile antenna provides maximum performance at the most useful radiation frequencies.

10 Met-5 Ft. L.	$12.95
15 Met-5 Ft. L.	12.95
20 Met-5 Ft. L.	12.95
40 Met-6 Ft. L.	14.95
80 Met-6 Ft. L.	14.95

NEW CITIZENS BAND
27.255 mc . . . $12.95

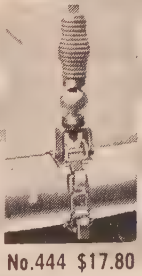
FIBRE-GLAS WHIPS

The Feather-Weight Antenna with Spring-Steel Strength!

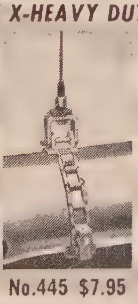
The completely weather-proof, breakproof antenna with special flexibility that prevents accidental shorting-out against overhead obstructions which sometimes cause loss of signal or serious damage to your equipment.

FG-60	60″	$4.95
FG-72	72″	$4.95
FG-84	84″	$5.15
FG-96	96″	$5.20

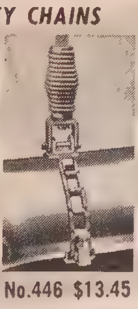
BUMPER MOUNTS
WITH NEW X-HEAVY DUTY CHAINS



No.444 $17.80



No.445 $7.95



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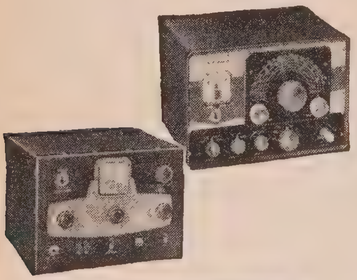

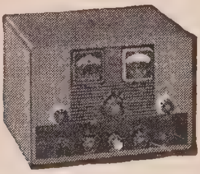

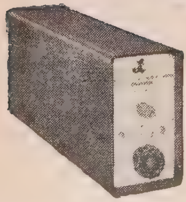

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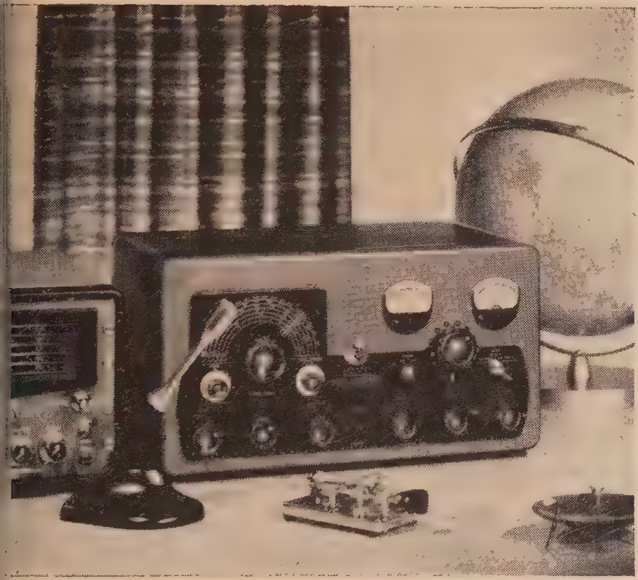

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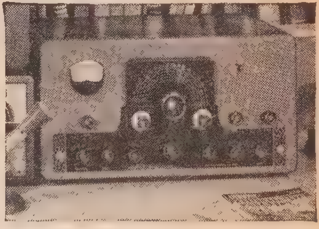

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Transistorized VFO

Wilfred M. Scherer, W2AEF
100 E. Palisade Ave.
Englewood, N. J.

During the past two years a transistorized *vfo* has been used for single sideband mobile operation by W2AEF/M. Its performance has been exemplary, especially in regards to stability, a factor of prime importance in connection with ssb operation.

Since a trend is developing towards transistorized equipment, it is needless to say that the excellent performance of this transistorized *vfo* has aroused much interest, and many requests have been received for information about it.

Although this model was designed for mobile work, it can, with a few modifications, be used to advantage for fixed-station operation, and the data set forth herein, should be helpful in the development of units for this and other applications.

The main attribute of the transistorized *vfo* is its superb stability. This is due to the absence of large thermal variations normally experienced with vacuum tubes, and is also due to the use of a steady potential source consisting of dry batteries (4 pen-lite cells). In addition, it can be made small for use as an outboard unit mounted near the steering wheel for ease of tuning. The transmitter itself then can be mounted at a more remote location out of the way. An outboard arrangement is also desirable for fixed-station use, since this will separate the *vfo* from the transmitter box containing heat-producing components.

One thing which must be tolerated with the transistorized *vfo* is its very low output level. This may be brought up to a useful amount by means of an additional amplifier, data on which is also given herein.

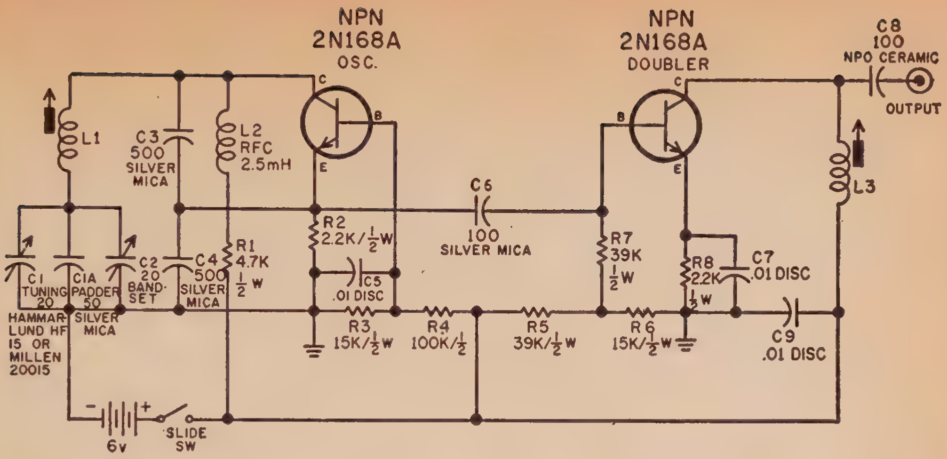
The *vfo* circuit is shown in fig. 1. A series tuned oscillator circuit is employed, with the frequency-determining tank tuned in the 2 *mc* region. The second transistor, shown in the output section, doubles to 4 *mc*. The oscillator frequency is half that of the output stage because it is the best practice, for the sake of stability, never to use a self-excited oscillator at a frequency to which any other stage is tuned.

A 4 *mc* output is used with this particular *vfo*. because ssb generation is produced at this frequency in the author's transmitter; however other frequency ranges may be used instead. For instance, the output frequency may be at another portion of the 3.5 *mc* band for working straight through, or for frequency multiplication into other bands. Another choice may be made around 5 *mc* for mixing with 9 *mc* ssb generators.

The circuit of the companion amplifier is shown in fig. 2. The first stage, a 6CB6 or 6BH6, is fix-tuned near 4 *mc* by L1 and the tube capacitances. The second stage is the power amplifier which is also tuned to 4 *mc*. It may also be used as a doubler tuned to twice the frequency. The output tube may be a 6CB6, 6BH6, 6AK6, 6AQ5 or 6CL6, depending on the output power requirements. The latter two tubes will deliver the highest output while the 6AK6 will produce about the same amount as do most of the commercially available *vfo's*.

Construction

A consideration which must be taken into account is the size and type of box in which the *vfo* is to be installed. This is of importance



L1-120 turns #34 enamel wire c lose wound on ½″ ceramic slug tuned form, Millen #69046. Adjust slug and cut off excess length.
L2-55 turns #34 enamel wire close wound on ¼″ ceramic slug tuned form, Millen #60043.
L2-RFC 2.5 mh.

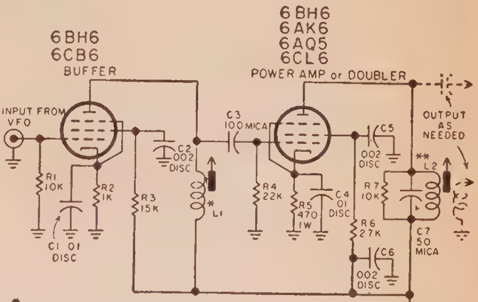
Fig. 1—Schematic of a transistorized vfo employing a series tuned oscillator.

In relation to frequency stability versus mechanical stability. With the *vfo* shown here, a compromise was necessary to keep the physical dimensions as small as practicable for mobile use. For fixed-station operation, this compromise is neither necessary nor desirable.

First, the box must be of such a size as to permit the oscillator coil, L1, to be mounted in a manner which will insure that the sides of the box are no closer to the coil than by an amount equal to two or three times the coil diameter. This will minimize deterioration of the coil Q, and external thermal changes, which might cause the sides of the box to expand or contract near the coil, will have less effect on the coil inductance. Internal components should also be kept away from the coil.

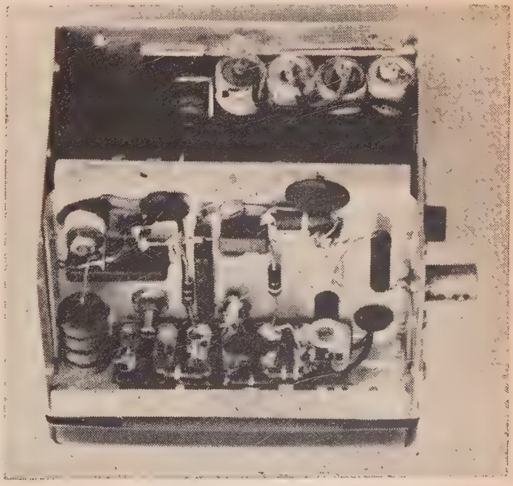
Material of at least 1/16″ thickness should be used for the box, and plenty of screws should be employed to secure its sides on *all* edges. The partition shelf should also be secured along all edges. One inch spacing between screws should be sufficient. The Bud Miniboxes are quite satisfactory if additional right-angle brackets are installed along the edges where no lip is located for fastening screws. These boxes may be obtained in a variety of sizes, the minimum suggested size being 4″ x 5″ x 6″ for fixed-station use. With the mobile unit shown here, a compromise was made to the use of a 3″ x 4″ x 5″ box cut down to 3″ x 4″ x 2½″.

The layout and wiring arrangement for the mobile unit may be seen at fig. 3. For a fixed-station model where the box dimensions may be made larger, the same general pattern still can be followed. As may be seen in the photographs, most of the wiring and the components



*L1 120mH, MEISSNER # 19-1921 MILLER # 4512
**L2-50T # 34 ENAMEL WIRE CLOSE WOUND ON 3/8″ DIA SLUG -TUNED FORM
ALL RESISTORS 1/2W UNLESS OTHERWISE SPECIFIED

Fig. 2—Companion amplifier fixed tuned near 4 mc is used to increase the low output of the vfo and may also be used as a doubler.



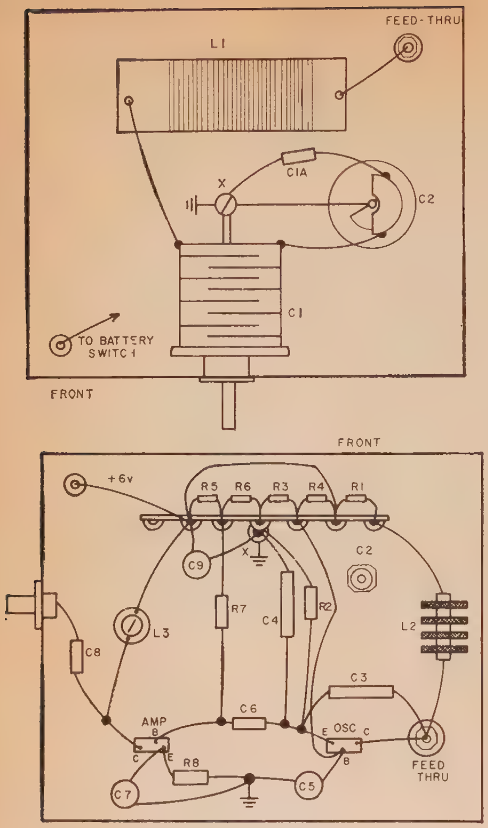


Fig. 3—Top and bottom view of the component layout on the shelf.

will be found at the top of the partition shelf.

The tuning and band-set capacitors, C1, C2, padder C1A, and the oscillator coil, L1, are mounted below the shelf. The sockets are mounted with their terminals on the upper side of the shelf, and the transistors are therefore inserted from below. The transistor at the right is the oscillator. At the right of its socket is a ceramic feed-through bushing for the lead between the transistor's collector terminal and one end of the oscillator coil.

A common ground is made at point *X* where the tie strip is fastened to the shelf. The common ground point is used for the components of the frequency determining circuit. These are C1, C1A, C2 and C4.

The output coil is mounted with its winding above the partition shelf to isolate it from the oscillator coil below. A BNC type coax output connector is mounted on one side of the upper section, and the power switch is mounted on the same side of the lower section. The four pen-lite cells, which are required to power the unit, are mounted in the lower part. These, or any other 6 volt dry battery source, may be placed outside of the box instead, without the necessity of additional leads, by the use of the scheme shown at fig. 4.

A Millen dial, #10039, with an 8 to 1 drive-ratio is used for easy tuning. It requires onl a small hole for coupling through to the tunin capacitor shaft, so no extra space is require behind the panel. This dial is designed to b fastened to the panel with two screws, but tw extra ones were installed near the bottom t give it better rigidity.

The transistor sockets are Jones type 2H3 These require a small oblong-shaped hole whic may be filed to size. After the sockets ar mounted and secured by their clip-rings, a application of Duco Cement around the mountings will improve their mechanical stability.

The oscillator coil is mounted firmly on ¼" thick piece of Lucite, and it is positione so direct and short connections may be mad to C1 and the collector feed-through bushing Contrary to usual practice, the leads betwee the coil and other frequency-determining elements are made with small wire instead o with large heavy wire. It has been the author' experience to find that the use of heavy rigi conductors can be a detriment in this application, particularly when a series-tuned oscillato is involved. This is because extremely rigi connections are prone to transmit vibration from components and parts of the box. Thes tend to produce microphonics and frequenc modulation when the box is subject to handlin or shock. In this respect, it has been foun best to use soft copper wire, size #28 o #30, connected between the terminals with very slight slack in tension.

The Q and mechanical stability of the oscillator coil are two factors of paramount importance if the best performance is to b realized. A coil wound on a ceramic forn will exhibit these desirable characteristics Since a compromise had to be tolerated wit the mobile model of the *vfo*, a small coil wit a marginal Q of 110 had to be employed. Thi was wound on an iron slug-tuned ceramic forn of ½" diameter (Millen #69046). A slight improvement of Q is realized with the iron cor of this specified component, but other form with different powdered iron cores were foun to cause a reduction in Q.

Other coils with high Q Ferrite cores wer initially tried, but were quickly discarded, because of instability resulting from the poo temperature coefficient of the core material and due to the fact that they were highly sensitive to changes in permeability when placed near certain magnetic fields. During the development work two interesting situations appeared in this regard. In one case, the presenc of a slightly magnetic screw driver near th *outside* of the box shifted the *vfo* frequency In another case, the magnetic field from a Weller electric soldering iron shifted and modulated the *vfo* frequency, and when this fiel was removed, the core permeability did no return to normal until after several minute had elapsed.

Where a large box can be utilized, coils hav ing a Q of between 200 and 300 may be used. These should be wound on ceramic forms 1″ to 2″ in diameter, with a coil winding length-to-diameter ratio of between 1 to 1 and 1.5 to 1, and with as large a size wire as space will permit for the required inductance. Space-winding the wire will also improve the Q. Use of double cotton-covered wire, close wound, will provide good Q, because the insulation gives a degree of copper-to-copper spacing between the turns. It is also easier to make a space-wound coil using this method. After the coil is wound, a coat of low-loss cement will insure its mechanical stability.

A slug-tuned coil provides a convenient means for adjusting the inductance for a given frequency range, and it also facilitates band-spreading and calibrating. National type XR-62 is a larger slug-tuned form which is good for this purpose.

Ceramic pillar type insulators make good forms for fix-tuned coils. Still higher Q may be realized with air-wound coils, but they usually require more space, and sometimes they are difficult to mount with sufficient mechanical rigidity.

The maximum permissible size of C3 and C4 will depend on the coil Q. As this is raised, the capacitance values may also be increased, and better overall stability will thereby be realized. Also, the best ratios of C3 to C4 will lie between 1 to 2 and 1 to 1. The values shown in fig. 1 are for a coil Q of 110 at 2 *mc*.

In cases where the circuit will not oscillate freely with a coil of a given Q, either C3 or C4 may be too large, or the coupling may not be sufficient, because the total capacitance of C1, C1A and C2 is too small.

The present model of the Transistorized VFO has a bandspread range of only 50 *kc* for an output range of 100 *kc* (from 3900 to 4000 *kc*). For other degrees of bandspread, the ratio between the tuning capacitor C1 and the band-set padders C1A and C2 must be changed. To increase the bandspread, C1 should be made larger, and L1 should be made smaller for a given frequency range. This also may be done with a reduction of C1A and C2, with an increase in L1; however, the coupling may then be too low to permit oscillation.

If the compact arrangement shown here is to be used for other output frequencies, the circuit constants will have to be changed accordingly. For 3.5 *mc* output (oscillator on 1.75 *mc*) turns may be added to L1, or C1, C1A and C2 may be increased as needed. For an output frequency near 5 *mc* (oscillator at 2.5 *mc*) turns may be removed from L1. The resonant frequency of the output circuit will also have to be changed. This depends on the inductance of L3 shunted by the total capacitance of C8 in series with that of the output cable (21 mmfd per foot for RG 59/U). Resonant circuits may be checked with a grid-dipper after the associated transistor is removed from its socket. With the series-tuned oscillator, the output tends to drop as the frequency is raised, so, in order to even the output level of the entire unit, L3 should be peaked near the high frequency end of the range.

Construction and layout of the companion amplifier is non-critical. Any arrangement, which is suitable for a particular situation, may be used. No external tuning control for its output will be needed over a limited frequency range, as this circuit is broadened by the loading of R7.

Operation

Difficulties which might be encountered in getting the *vfo* to oscillate properly already have been partly covered. In addition, better performance may be experienced with different transistors among any one type. A good idea is to check them in a tester at the time of purchase. Select those with the highest gain and minimum leakage. G.E. 2N170 NPN type transistors were originally used; however, G.E. 2N168A's (NPN) were found to be more uniform in their characteristics. Others which may be used are G.E. 2N167 (NPN), or PNP types 2N136 and 2N137. PNP types necessitate a reversal of battery polarity.

Output at either the fundamental or the second harmonic may be obtained with the use of a 10,000 ohm resistor in place of L3, but the output will be lower. Another arrangement,

[*Continued on page 125*]

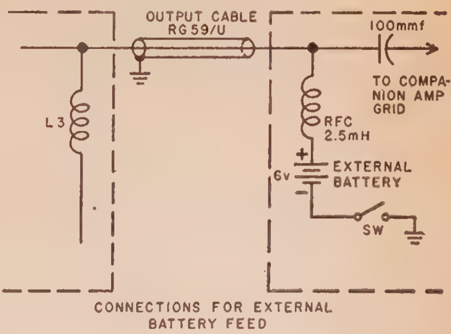
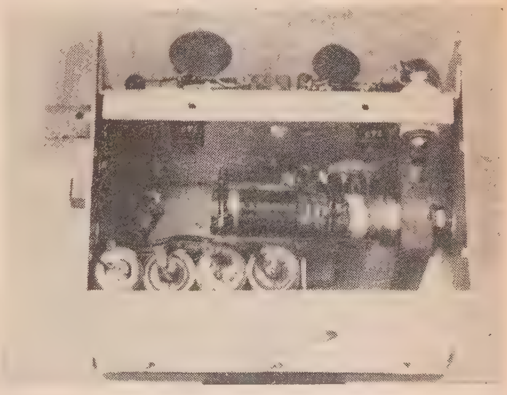


Fig. 4—If the batteries are to be located outside the case this circuit may be used.



Russian Hams Pick Up Lunik Signals Easily

Joseph Zelle, W8FAZ
Technical Staff, WERE AM-FM-TV
Cleveland, Ohio

When the Russions fired their Lunik last January 3rd, the radio signals were apparently picked up in Russia without any trouble. Even radio amateurs beyond the Iron Curtain at once tuned in the three frequencies given out by Moscow Radio. This success was in sharp contrast to the Western World, where no tracking station was able to identify the Lunik signals positively.

One of the first to receive the radio signals in Moscow from the space craft was N. Kazanskey, UA3AF. For ten minutes he picked up telegraph transmissions at 0040 MST on two frequencies, 19.993 and 19.997 mc with a strength of S6-7.

Several others in Moscow heard the voice of the rocket. R. Hauckman, UA3CH, heard it at 0830 MST. A little later B. Mashkov, a young operator at the Pioneers' Home station heard it. V. Kozlov and T. Shcheglov, radio operators of the Central Radio Club, UA3KAA, even succeeded in recording the signals on tape.

In Stalingrad, U. Byertyayev, UJ8AG, copied the signal for ten minutes at 0930 MST. In Gomyel, UC2KAB monitored the transmitters clearly from 1145 to 1155 MST, when the Lunik was some 125,000 miles away (200,000km.). UB5KCA reported 19.995 *mc* signals S6 at about 1500 hours MST, when the Soviet cosmic rocket following its charted course, had passed more than half the distance to the moon.

Ten radio amateurs in Chita, standing radio watch, likewise heard the signals. Grigoryev, an instructor of their DOSAAF Radio Club, recorded the signals on tape. At the collective radio station, UA1KMC of the Borovichi Radio Club, operators made a fix on the 19.997 *mc* frequency at 0813 MST, January 3rd. Estonian radio hams were successful too, as reported by Radio Station UP2KAA of Tallin. In Kursk, UA3WZ, O. Kolozin, was successful in tuning in the rocket signals several times.

Radio Station U05KPM of Kuibishyev reported many Moldavian radio amateurs had heard the cosmic rocket radio signals. Among these hams was veteran shortwaver, A. Kamalyagin, UA4IF.

Later, signals were reported from Batumi. At 2036 MST, January 3rd, the scientific observation station located in the eastern part of the Soviet Union picked up the signals early. Unlike the unsuccessful early attempt at Jodrell Bank, Batumi reported hearing signals considerably down below the horizon on the following re-pickup of rocket signals. Soviet radio amateurs in the area stood radio watch along with the station. From 2100 to 2130 hours, Radio Amateur G. Sidoryenko, UF6PB, heard the signals very loudly.

On January 4th at 0543 by Moscow Times the Soviet rocket reached the closest point to the moon, according to Soviet scientists. At that time, M. Livonsky, UA1BG, of Leningrad, monitored the rocket radio for about an hour, with signal strength reported at RST 578.

The most surprising report came from Lower Tagil, by the operator of Radio Station UA9KCC of Smolin. The signal was picked up at 1557 MST on January 4th. At 1725 the signals were still very loud. At that time, the Soviet rocket was located about 280,000 miles (450,000 km) from the center of the earth.

All these reports from radio hams were of a preliminary nature. They were included in the January issue of *Radio* the official organ of Russian amateurs, DOSAAF. Just how many of these reports are questionable is hard to determine.

Conversely, no professional tracking and observing stations in the Western World reported hearing the Lunik signals. No United Kingdom tracking stations had any success, including Prof. A.C.B. Lovell's huge radio-telescope at Jodrell Bank. In America, three non-professional listening stations compared signals recorded on tape, but all three were different. Moreover, none of the three taped sounds agreed with the Lunik sounds officially broadcast by Radio Moscow on January 3rd.

The writer himself monitored the three listed frequencies, 19.993, 19.995, and 19.997 *mc* and heard signals. However, these were highly questionable as they were far too loud and too commercial in sound to be considered to have originated 68,000 miles away.

[*Continued on page 125*]

A Positive Peak Expander or More Modulation for Everyone

J. B. Compton, W3BSA, ex-W3WLZ
287 Baker Hall,
University of Colorado,
Boulder, Colo.

The purpose of this article is to demonstrate a method by which you can increase your modulation percentage to the maximum the modulator can deliver without regard to the power input to the final amplifier. This same method is equally applicable to either a flea power rig or a California (multi-) kilowatt.

The circuit is not a limiter or compressor but merely a method of adjusting the ratio of positive to negative peaks at a low level. It is installed at a low level in the speech amplifier so that the modulator does not have to deliver extra power as is necessary in other systems designed to accomplish the same end.

This circuit is based on the principle that germanium diodes conduct only in one direction, so if one is connected for forward conduction and the other is connected for reverse conduction one may be tapped down on a resistance and that side of the audio frequency wave suppressed.

Two different circuits are shown (figs 1 and 2) for different situations in your transmitter. The first step in applying this circuit is to find the number of phase inversions from the stage where you will incorporate this circuit to the output transformer in the modulator stage. (It might be well to note that this circuit should be installed at a level of about 3-30 volts peak in the speech amplifier as it does not work well at levels below about one volt.) This tells you whether you want to suppress the positive or negative side of the audio signal in order to come out with the negative suppressed after a number of stages.

This circuit does not spell the end for clippers and compressors because they may be used with this circuit to even greater advantage by setting the adaptor for an optimum value of positive versus negative peak and setting the clipper or compressor to maintain this level.

This circuit has been successfully included in a mobile rig using a reference shift modulator. The reports received from this rig were that with the audio gain all the way open (30 watts of audio on a 30 watt carrier) they noticed no overmodulation, but when the adaptor was cut out splattering made the signal almost unintelligible. When the gain was cut down to the point where it was not overmodulating, a decided drop in strength of modulation was noticed even though the signal was clean. I think this is a pretty good argument for those who believe in getting the most out of their rigs. ■

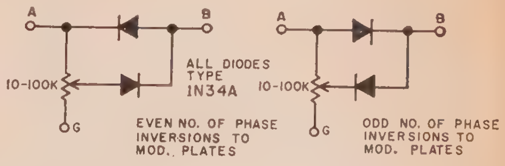

A
B
10-100K
G
ALL DIODES TYPE 1N34A
EVEN NO. OF PHASE INVERSIONS TO MOD. PLATES
A
B
10-100K
G
ODD NO. OF PHASE INVERSIONS TO MOD. PLATES

Fig. 1—Rectifier circuit arrangements for even and odd inversions in the speech amp.

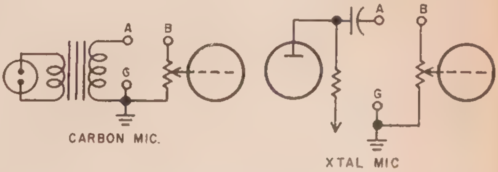


Fig. 2—The insertion points for the diodes in either a crystal or carbon microphone circuit.

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14 Sherwood Road
Stamford, Conn.

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W8JIN—586,767
W3GRF—580,425
OK1FF—573,352
UB5WF—565,701
HB9QR—562,565
JA1VX—546,410
W2BXA—536,352

MULTI-OPERATOR

All Band

TOP TEN

K2GL — 2,009,280

W6YMD—1,376,725
DJ3JZ—1,003,101
W3AOH— 946,854
OH1AA— 816,794
UB5KBB— 675,840
CX3BH— 668,964
UB5KAB— 542,828
K6EVR— 501,767
W3WV—474,048

CONTINENTAL LEADERS

28 mc
K8AEK—166,270
JA3IS— 87,685
SP2DX— 85,936
FA8RJ— 43,740
KH6DS— 11,985

14 mc
W2AIW—201,253
IT1TAI—196,911
HS1C—155,610
ZS5DE—113,025
KH6KC—105,336
PY4AO— 51,148

21 mc
W4YHD—180,340
OK1LM—105,800
VS9AS— 69,040
KH6CJJ— 51,000
ZS6APQ— 43,550

7 mc
W8FGX— 82,677
G4CP— 60,310
VK3XB— 9,604

3.5 mc
OK1MG—10,710
W1BU— 7,380
KX6AF— 1,720

Those calls at the top of the heap might be of a foreign origin but the men behind the key certainly are not.

The King of the CW men this year is Glenn Luse, CN8JX, on a tour of duty in Morocco. And runner-up is none other than Larry Eisler, SV0WP, who is W3JTC stateside, also on overseas duty for Uncle, in Greece.

Both boys made an all out effort since this might be their last year in a choice DX location. Glenn had a good thing going, with a fertile field of 3 pointers just north of him, while Larry had the misfortune of being on the wrong side of the Mediterranean, and those same contacts only counted one point. Even with a record 1,384 QSOs Larry could not overcome this handicap.

Congratulations Glenn, where do we send the Larry LeKashman, W9IOP Trophy, overseas or to your stateside QTH?

There were so many fine scores in the top brackets that in all fairness we had to enlarge the box and create a new listing, "The Half Million Club."

All continents are well represented in the Club, with most of the calls well known in DX contest circles. Prominent as usual is KH6IJ. This might be Nosey's last World Wide contest for a while as he is coming east soon for advanced studies at Harvard. We'll sure miss that staccato KH6IJ, but I'll bet he will show up as a W1 (Woe is me.)

However among all those familiar calls you will note a couple of newcomers, UA9DN and UB5WF, and a splendid job they did too. You might recall that last year I predicted "things to come." Too bad more of the USSR boys did not send us their logs, as they were sure in there knocking 'em off.

Stateside only a few of the boys passed the half million mark. Jim Ringland, W8JIN was the leader with Lenny Chertok, W3GRF close on his tail.

The big mystery, which I'm still trying to figure out, was the absence of logs from the 4x4 contingent. Their calls show up on all the logs we checked but not a single entry was received. It doesn't figure.

Those that made more than a 1000 contacts are SV0WP, KH6IJ, VP7BT, CN8JX, CX2CO and KH6AYG. That my friend is a lot of brass-pounding in one week end.

W3GRF came up with the highest Zone mulplier, 106, and also the biggest overall multilier, 327. PA0LZ with 229 had the highest ountry multiplier.

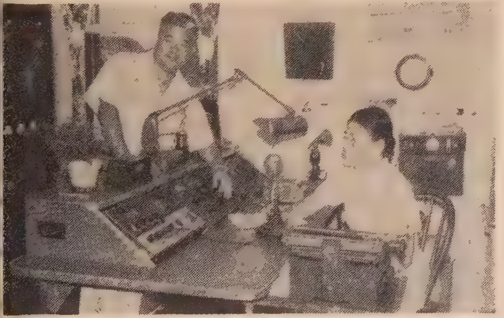
The Single Band division, now by far the ost popular category of our contest, had so any outstanding scores that here again it was ecessary to change the listing and give deservg credit to the continental leaders.

Activity on the three top bands was pretty venly divided, but the highest scores were on 4 *mc*. It was on this band that Charley Rogers, 2AIW made his winning score of 201,253 oints. He wins the new John Ryan, W7KVU rophy for the highest Single Band score by a ngle operator. He was closely pressed by IT1-AI but Dom didn't have the multiplier to back p his greater number of contacts.

Outstanding scores were also turned in by 8AEK and W4YHD on 28 and 21 *mc* respecvely. But to my mind the outstanding single and score is the 82,677 points made on 7 *mc* y W8FGX. Jake made 311 QSOs and more han doubled his last year's score. Mention must lso be made of G4CP's 404 contacts on this and but those one pointers from Europe held own his score.

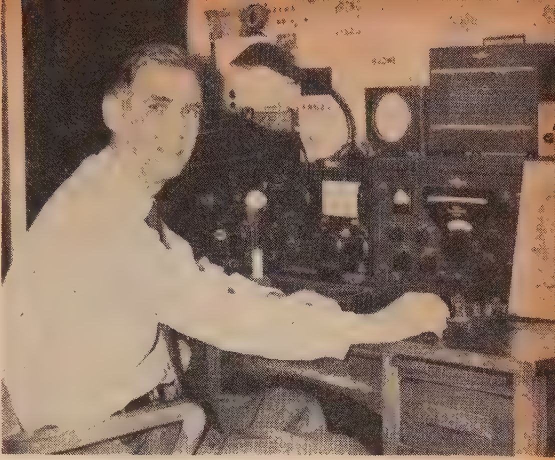
Once again 80 was a European party, with K1MG leading the pack with 10,710 points nd 230 contacts. The outstanding contender tateside was W1BU who did right well for that and.

And wonders of wonders, we finally got some entries on the Top Band, four to be exact and each one a certificate winner. True, the scores were ridiculously low but the boys put in the time and deserve a reward for their effort. OK2NR with 33 QSOs was the leader and W7ZVY was the lone W entry. Working KH6IJ was the big thrill of the contest for him. Remember, this was on 160.



KH6IJ—The fabulous Katashi Nose and the ex-YL. No, she's not a ham, her interest is painting.

CE3AG—Luis Desmaras, at right the regular station equipment. At the left the equipment he used on his recent CE0ZA trip.



W8UPN—John Grievson, 21 mc winner for his section.

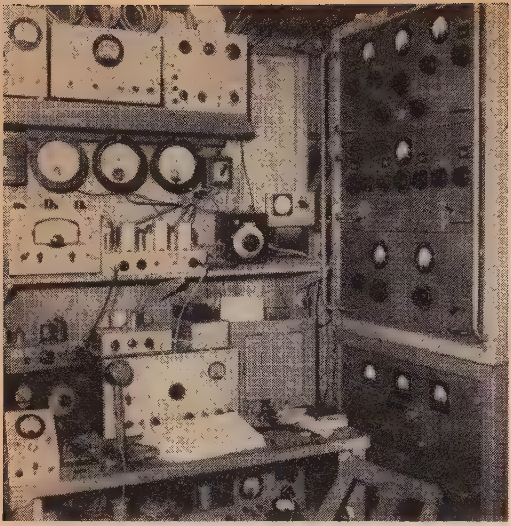
CN8JX—Glenn Luse in a happy mood when he heard that he was Top Man for 1958.

Only a handful of single banders worked 100 different countries, W1HZ, W1JYH and W9IU to be exact, and W4KFC in the multi-operator group. This was on 20 only. In the all band multi-operator group quite a few worked more than 100 different countries but this was with a combination of all bands. No one worked all 40 zones.

The most contacts on one band, 807, was made on 21 *mc* by KL7PIV. Ed probably made an all out effort since this was his swan song from Alaska. He and Sheila, KL7BHE are both back in the States now.

This was also the swan song for Ludvik and Milada of JT1AA and JT1YL fame. Said Mila, "contesting is a bit difficult if you have a husband who wants to be provisioned or to use the rig on his own account." Now that you are back home Mila, get a rig of your own and come contest time tell Ludvik to rustle up his grub or go hungry.

The scores turned in by the multi-operator stations is more in keeping with what one would



JA1VX—Operating position of the leading Japanese station in this year's contest.

F7CV—David Knight, 14 mc winner for the US contingent in France.

W2AIW—Charles Rogers and the rig that delivered high single band score for him.

expect from a group of operators with 4 or complete transmitters and separate antennae a their disposal.

K2GL had as many as four transmitters go ing at the same time and with the score o each band equal to the leading single band sta tions, it's small wonder that they broke the million mark. "Is it true, Buzz, next year yo are installing an electronic computer to kee score?" That means that the Hazard Reeves K2GL Trophy goes to ——— K2GL, I gues This year the West Coast giant W6YMD als broke the million mark as did the gang a DJ3JZ.

It has been suggested that we re-classify th multi-operator Section. Perhaps divide it int two divisions, single transmitter and multi-trans mitter.

Last year's winner of the All Band divisio Vic Clark, W4KFC decided to take it easy th year and go Single Band, and with the help o his son K4OKZ worked the highest numb of different countries.

We wonder if a change here would als be in order. Eliminate the single band com petition in the multi-operator section.

The appearance of DL7AH and his cre from Luxembourg, created plenty of excit ment and they gave many boys a new countr

The novice didn't take advantage of the o portunity we have been offering so that div sion will be scratched in the next contest.

And now the Clubs. It was no contest, th North Jersey gang almost doubling the sco of their nearest competitor, the Potomac Va ley boys. This was really an organized effo as practically every member of the club co tributed to the club score. So that means th they will add a second CQ Plaque to their co lection. Looks like I'll be making another tr to Jersey.

Once again it becomes necessary for us make clear the fact that competition is limit to affiliated clubs only. All the DARC statio in the contest requested their scores be credit to that organization, as did members of the RC for the Radio Club of Uruguay. However the are national organizations and in all fairne cannot be considered as clubs. Incidentally th RCU boys were the only bright spot in the r turns from South America. However the Ce tral Radio Club of Praha, which is a club with the C.A.V. and the Japan DX Radio Club, a organization within the J.A.R.L., are differe stories. Have we made ourselves clear?

Returns in the CW Section of the conte were a bit better than last year, 964 logs compared to 932 in 1957. And 92 countri against 90 last year. The overall score, Pho and CW, is 1493 reports from 116 countri a decided gain in country total.

Mere reference to the members of t Contest Committee seems small thanks for t wonderful job they did, for without their he these contests would just be impossible. On gain it was the untiring efforts of the old re-ables W2BO, "Mac" McIntire, W2JB, "Ben" azarus and the addition of W1GYE, "Andy" alashuk that made these returns possible. We lso want to acknowledge a helping hand from W1DHO, W1MDO, K1IOX and W6LER/1.

Most of the certificates should be on their way by the time you read this, so allow a reasonable length of time before you start griping that you have not received it.

Number groups after call letters denote the ollowing: Band, final score, number of QSOs, ones, and countries. Letters designate power used. A—Up to 35 watts. B—Up to 150 watts. C—Up to 500 watts. D—500 watts and over. Winners are in **bold face** type.

Single Operator

NORTH AMERICA

nited States

ODW	**A**	**248,565**	**404**	**67**	**152**	**D**
BIH	A	205,821	254	92	205	D
NQT	A	178,791	337	59	124	D
EQ	A	162,162	296	64	134	D
FZ	A	158,670	281	67	138	D
CJH	A	94,064	243	41	95	D
AQE	A	88,236	245	46	83	—
CCA	A	11,644	53	26	43	B
PLJ	A	3,168	21	14	22	B
ZUU	A	836	14	9	13	—
IUU	**28**	**33,125**	**158**	**21**	**52**	**B**
ACB	28	31,520	139	24	56	B
WY	28	21,483	120	19	44	B
ZD	28	20,096	114	19	45	D
MDO	28	17,792	101	20	44	B
FQA	28	2,760	39	7	17	—
AZY	**21**	**78,832**	**260**	**32**	**72**	**C**
CTW	21	10,927	83	16	33	D
HZ	14	123,900	314	35	104	D
JYH	A	95,880	246	36	100	D
AEW	14	37,620	147	29	66	—
NLM	14	28,498	123	27	59	C
LER	14	10,296	57	22	44	B
AWE	14	7,224	58	13	29	—
AHS	14	405	9	6	9	—
UQP	14	273	7	6	7	B
KDW	**7**	**10,764**	**98**	**9**	**30**	**C**
GYE	7	9,495	79	14	31	C
BU	**3.5**	**7,380**	**79**	**11**	**25**	**D**
YIS	3.5	1,725	43	9	16	B
BXA	**A**	**536,352**	**639**	**87**	**215**	**D**
GMO	**A**	**438,786**	**549**	**87**	**195**	**D**
AGW	**A**	**429,632**	**548**	**76**	**198**	**D**
EQS	A	403,832	512	94	192	D
GUM	A	400,040	513	86	188	D
JVU	A	265,716	387	76	168	D
PJ	A	203,796	353	70	134	B
GJD	A	193,568	367	21	132	D
TQR	A	187,254	332	64	138	B
OBX	A	183,529	296	66	157	B
YOR	A	170,748	326	60	126	D
YTH	A	156,940	373	39	94	D
HZY	A	154,071	297	50	109	D
LV	A	128,700	242	61	134	D
EW	A	101,120	226	54	106	C
BSM	A	83,326	229	39	83	D
GT	A	71,070	208	32	83	D
TWC	A	66,930	172	45	93	B
LAX	A	48,272	156	39	73	C
QJM	A	44,511	145	40	71	C
AQT	A	31,191	105	39	72	C
HL	A	20,064	112	24	42	C
QKJ	A	16,470	92	16	45	C
QDY	A	10,368	66	19	35	B
KE	A	9,480	64	23	37	C
ZA	A	3,255	44	10	15	—
PTI	**28**	**57,024**	**243**	**22**	**59**	**C**
BOK	28	36,778	170	21	53	B
CGJ	28	32,604	149	23	53	C
KS	28	20,313	118	20	41	C
TG	28	19,734	110	21	45	C
DD	28	5,064	50	10	24	C
PR	28	3,108	28	17	20	B
BU	28	2,117	30	9	20	C
ZJ	28	1,792	22	9	19	A
BW	28	96	4	4	4	B
YS	**21**	**59,171**	**196**	**33**	**74**	**D**
UR	21	38,368	161	29	59	A
JT	21	20,007	131	21	46	B
VZ	21	19,440	118	19	41	C
IY	21	7,755	63	15	32	B
CA	21	2,376	33	13	20	B
MBX	21	180	7	4	6	B
IW	**14**	**201,253**	**495**	**38**	**99**	**D**
UC	14	123,444	339	35	92	D
PE	14	110,075	325	36	83	D
A	14	18,755	117	15	40	D
CQ	14	14,784	67	26	58	D
W2CJM	14	9,016	66	16	33	—
W2YLS	14	8,232	77	21	84	—
W2GT	14	6,713	49	14	35	B
W2JB	14	3,151	30	13	26	C
K2CTK	14	392	10	5	9	B
K2RTH	14	130	7	5	5	—
W2GZZ	**7**	**19,376**	**123**	**16**	**40**	**—**
K2PRR	7	893	23	8	11	—
W2PRE	**3.5**	**3,840**	**56**	**10**	**22**	**—**
W3GRF	**A**	**580,425**	**637**	**106**	**221**	**D**
W3LOE	**A**	**469,800**	**451**	**99**	**261**	**D**
K3AOH	A	175,130	310	68	143	C
W3WSF	A	111,078	255	45	108	C
W3EIS	A	92,511	201	58	113	D
W3MSR	A	88,563	211	56	103	D
W3ZAO	A	85,120	171	50	102	C
K3CBQ	A	78,840	205	40	95	D
W3AYD	A	75,150	167	59	108	C
W3KTW	A	65,824	189	40	81	C
W3WJD	A	49,560	153	36	84	B
W3KA	A	36,846	138	30	59	C
W3RPG	A	17,464	156	48	73	D
W3EAN	A	9,615	73	15	44	—
W3KFQ	**28**	**76,050**	**291**	**27**	**63**	**D**
W3DBX	28	64,032	230	27	65	C
W3LSG	28	61,795	254	26	59	C
W3TLN	28	54,094	217	26	60	C
W3GKY	28	18,970	96	20	50	B
W3ZWI	28	14,076	97	14	37	B
W3QQL	28	13,040	59	23	57	B
K3CIO	28	6,384	49	16	32	B
W3HEC	**21**	**87,156**	**289**	**27**	**81**	**D**
W3AYS	21	72,306	242	30	73	D
W3NCF	21	57,521	214	29	68	C
W3ZQ	21	26,568	120	25	56	D
W3AFW	21	4,485	45	12	27	B
W3CMH	21	4,104	50	14	12	B
W3VTH	21	3,106	35	13	23	—
W3GID	21	1,700	28	10	15	—
W3MEJ	**14**	**107,004**	**351**	**35**	**76**	**D**
W3ADZ	14	68,634	197	36	87	D
W3AEL	14	10,600	70	16	37	D
K3BQB	14	9,577	60	19	42	D
W3BVN	**7**	**42,624**	**211**	**19**	**53**	**D**
W3NOH	7	6,800	61	9	31	B
W3IIF	7	5,628	56	14	28	—
W4AIX	**A**	**191,749**	**302**	**72**	**147**	**D**
W4BJ	A	115,248	197	61	135	D
K4QIJ	A	92,056	227	51	97	C
W4PNK	A	87,615	236	44	91	D
K4GMX	A	49,725	145	36	81	D
W4WBC	A	27,734	112	35	63	C
W4GF	A	17,856	91	26	46	D
W4EIE	A	10,366	55	31	40	D
W4KAC	A	6,499	49	24	45	D
W4DHZ	**28**	**65,236**	**250**	**29**	**65**	**D**
W4JAT	**28**	**64,246**	**244**	**27**	**64**	**C**
K4TXU	28	40,550	194	24	51	C
K4HXF	28	29,784	142	23	50	D
W4GXB	28	27,588	146	20	46	D
W4IEH	28	20,672	112	18	46	C
K4HPR	28	16,343	102	21	38	B
K4OMR	28	15,232	94	15	41	—
K4AL	28	9,735	59	17	42	B
K4BOM	28	5,292	52	15	27	B
K4SXR	28	5,220	50	9	27	B
W4YHD	**21**	**180,340**	**504**	**37**	**90**	**D**
K4GIB	21	28,000	144	21	49	C
K4OAQ	21	25,063	137	24	47	C
K4DRO	21	12,805	76	24	41	B
K4PHY	21	9,918	69	20	38	B
W4WSF	21	8,640	60	17	37	B
K4QIY	21	4,692	43	17	29	B
K4RJM	21	1,675	25	9	16	B
W4NYF	21	368	9	8	8	—
W4EPA	**14**	**116,064**	**332**	**34**	**90**	**D**
W4BQY	**14**	**56,364**	**138**	**33**	**89**	**D**
W4LYV	14	48,840	157	32	79	D
K4LGI	14	43,761	174	27	60	C
W4SHX	14	36,660	138	28	66	C
W4IFN	14	30,276	125	31	56	D
W4PLL	14	24,960	131	25	54	C
W4HKJ	14	21,760	97	28	52	D
W4JFF	14	14,718	83	23	43	B
W4HA	14	8,568	56	20	36	C
W4JJL	14	5,060	41	17	27	D
W4ZQK	14	1,485	24	9	18	B
W4JLW	**7**	**17,225**	**104**	**23**	**42**	**C**
W4NBV	7	2,842	33	11	18	D
K4LVP	7	2,650	39	8	17	B
K5LZO	**A**	**192,610**	**386**	**63**	**124**	**D**
W5ZD	A	138,200	264	70	130	D
W5BUK	A	34,692	121	49	69	D
W5BRR	A	34,608	118	50	62	B
W5PM	A	27,168	102	39	57	D
K5JZY	A	14,049	88	22	41	B
W5LGG	**21**	**47,340**	**187**	**29**	**61**	**B**
K5JCC	**21**	**6,250**	**56**	**20**	**30**	**B**
W1PVF/5	21	1,092	20	13	13	B
K5AVA	21	330	13	6	9	B
W5KC	**14**	**34,170**	**145**	**27**	**58**	**C**
W5NOP	14	23,268	96	31	53	D
W5HHE	14	10,880	70	24	40	D
W5HNS	14	420	12	7	8	B
W6TT	**A**	**339,300**	**436**	**101**	**189**	**D**
K6SXA	**A**	**308,305**	**391**	**128**	**185**	**B**
W6KG	**A**	**210,512**	**328**	**86**	**150**	**D**
W6UF	A	205,692	399	62	121	D
K6VTQ	A	179,332	317	77	137	D
W6NJU	A	157,300	267	82	138	D
K6UYC	A	119,028	230	69	113	D
W6SIA	A	97,226	218	66	107	D
W6IPH	A	68,911	186	56	81	D
W6NKR	A	61,759	153	30	61	D
W6IBD	A	50,430	167	50	73	D
K6CTV	A	44,142	264	68	120	D
K6RTK	A	30,192	117	41	61	D
W6ID	A	28,000	96	43	69	D
W6BYH	A	24,070	101	28	55	—
W6QDE	A	22,356	87	39	53	D
W6FYM	A	21,408	89	40	56	—
W6CLZ	A	3,268	35	22	21	B
W6UFJ	A	396	11	6	6	A
W6PQW	**28**	**44,965**	**200**	**28**	**57**	**B**
K6DDO	28	42,579	190	29	54	D
K6VXM	28	28,187	150	23	48	C
K6IEC	28	2,068	34	10	12	B
K6PDA	**21**	**26,207**	**137**	**24**	**49**	**D**
K6DCE	21	23,424	140	21	43	D
W6YC	21	14,480	111	18	35	C
W6BIL	21	4,505	38	17	28	D
W6BJH	21	3,348	39	13	18	B
KN6LJU	21	110	11	6	5	B
K6OCX	**14**	**10,032**	**71**	**23**	**34**	**C**
W6AJJ	14	5,565	39	21	32	B
K6UFX	14	1,104	18	10	13	—
K6ZMB	14	210	7	6	21	D
K6QHC	3.5	1,232	26	13	15	C
W6LDD	3.5	760	17	9	10	D
W6GWQ	3.5	352	15	8	8	D
W7WDM	**A**	**161,332**	**277**	**78**	**134**	**—**
W7PQE	A	125,430	259	74	111	D
W7BUL	A	22,140	115	45	45	C
W7EIZ	A	14,350	77	25	45	C
W7LNG	A	8,550	66	25	32	C
K7BWH	A	6,820	50	24	31	—
W7ENA	A	5,875	52	22	25	B
W7PJC	A	1,377	17	12	15	C
W7LEV	**28**	**26,130**	**143**	**23**	**44**	**B**
K7AOZ	28	2,958	51	13	16	B
W7AHX	**21**	**22,372**	**120**	**22**	**46**	**C**
W7CNL	21	15,360	98	21	39	B
W7VY	**14**	**137,410**	**365**	**33**	**97**	**D**
W7AJS	14	31,535	130	28	57	D
W7CAB	14	10,360	68	19	37	C
W7JLU	**7**	**10,704**	**95**	**21**	**27**	**D**
W7ZVY	**1.8**	**24**	**14**	**3**	**3**	**B**
W8JIN	**A**	**586,767**	**657**	**99**	**218**	**D**
W8TUO	**A**	**279,432**	**389**	**91**	**163**	**D**
W8EV	A	172,617	153	58	105	D
W8RQ	A	149,736	270	60	144	C
W8KPL	A	122,672	269	50	114	C
W8ONA	A	44,067	142	38	73	C
W8DUS	A	43,560	85	43	78	D
W8MQR	A	33,462	122	36	63	D
W8BDO	A	11,204	66	30	42	B
W8DWP	A	5,508	41	24	30	B
K8AEK	**28**	**166,270**	**520**	**37**	**93**	**C**
W8KIA	28	48,762	199	26	60	C
W8UMR	28	24,500	124	20	50	B
K8BNR	28	2,880	30	9	23	B
K8HVT	28	2,436	33	9	19	—
W8UPN	**21**	**123,520**	**359**	**33**	**75**	**D**
W8CCD	21	54,208	217	24	62	B
W8BHW	21	50,249	168	33	76	D
W8LSA	21	24,817	110	26	57	D
W8KXO	21	21,770	114	22	48	B
K8HFO	21	18,389	99	23	48	B
W8TTN	21	11,154	67	27	39	C
K8HAH	21	3,588	35	14	25	B
K8AEB	21	120	5	4	4	B
W8OCT	**14**	**108,599**	**290**	**34**	**97**	**D**
W8KJP	14	48,369	279	21	48	C
W8ALP	14	38,014	166	28	55	—
W8YIN	14	29,760	145	26	54	B
W8WBV	14	27,798	119	26	56	C
W8FIT	14	6,136	62	23	36	B
W8FGX	**7**	**82,677**	**311**	**27**	**66**	**D**
W8GKB	7	11,968	81	22	42	—
W9HUZ	**A**	**339,528**	**428**	**88**	**194**	**D**
W9LNM	**A**	**338,230**	**408**	**99**	**199**	**D**
W9ERU	A	313,992	412	83	184	D
W9EWC	A	216,528	364	72	136	D
W9IRH	A	191,142	328	79	143	D
W9NII	A	121,014	272	54	108	C
W9QNO	A	69,814	186	42	92	D
K9CUY	A	38,627	134	34	73	B
K9PJN	A	21,816	85	41	60	C
W9MAK	A	13,430	70	33	46	B
W9KXK	A	6,820	75	22	44	—
W9LQF	A	4,773	39	13	30	—
K9KEV	A	3,390	41	18	24	C
K9BLY	A	3,040	11	9	11	—
W9NIU	A	124	6	4	4	B
W9ZTD	**28**	**68,996**	**262**	**26**	**68**	**D**
W9YYG	28	48,560	213	25	59	C
W9WWJ	28	25,489	127	20	51	C
W9JID	28	19,240	106	21	44	C
W9WIO	28	9,102	28	10	33	—
K9CWD	28	7,740	61	15	30	—
W9HTF	28	4,223	36	16	25	—
W9FYM	28	749	13	7	13	C
K9BCK	**21**	**40,832**	**168**	**28**	**60**	**C**
W9TKR	21	5,520	49	17	31	C
K9GYW	21	1,342	22	13	22	B
W9IU	**14**	**180,429**	**456**	**37**	**100**	**D**
W9VL	14	26,372	120	24	52	D
K9CLO	14	21,060	100	23	55	D
K9HMY	14	10,148	66	21	38	B
W9FDL	14	5,812	44	18	30	C
W9KEJ	14	294	9	6	8	B
W9PNE	**3.5**	**1,846**	**51**	**10**	**16**	**C**
W0GDH	**A**	**237,056**	**339**	**92**	**164**	**D**
W0DAE	A	175,136	304	65	143	D
W0GUV	A	51,150	134	57	93	C
K0ITF	A	21,168	90	39	59	D
W0VIP	A	3,198	31	16	23	—
W0VFE	**28**	**25,137**	**145**	**21**	**42**	**B**
W0MCX	28	3,780	42	12	23	B
K0DQI	28	3,762	37	14	24	B
K0BIT	**21**	**61,440**	**229**	**29**	**67**	**D**
K0LFY	21	20,468	119	22	46	B
W0ZYB	**14**	**39,292**	**148**	**31**	**63**	**D**
W0SVC	14	37,758	146	31	62	C
W0TKY	**7**	**6,192**	**66**	**17**	**26**	**C**
K0HGB	7	888	19	12	12	D

Alaska

KL7BTF	A	31,244	313	31	42	B
KL7PIV	21	139,293	807	30	69	D
KL7GI	14	22,099	310	17	32	C

Bahama Is.

VP7BT	A	298,316	1269	56	108	B

Canada

VE1MX	A	4,089	109	12	17	B
VE1YB	28	9,828	92	13	29	C
VE1EP	14	25,288	88	30	79	C
VE1EK	21	1,104	46	5	11	A
VO2NA	A	24,882	379	26	32	C
W0AIH H/VE3	A	21,010	149	46	82	D
VE3RN	21	3,090	46	11	19	B
VE3JZ	14	59,645	341	27	52	C
VE5DZ	14	1,160	32	13	16	C
VE7ZM	A	148,599	387	64	107	C
VE7EH	A	86,319	368	60	79	B
VE7CE	28	2,001	28	13	16	C
VE7SB	14	27,898	140	22	52	D
VE8FO	A	96,408	303	60	96	D

Canal Zone

KZ5LC	A	105,996	604	47	74	C

Cuba

CO2US	A	2,542	48	22	19	C

Greenland

KG1CK	21	6,534	165	9	18	B
OX3UD	14	8,624	96	7	16	B

Puerto Rico

KP4AOO	A	55,900	513	33	53	B

Trinidad, B.W.I.

VP4LA	A	36,740	224	24	31	B

AFRICA

Algeria

FA9UO	A	56,175	262	28	47	B
FA8RJ	28	43,740	162	27	63	A

Belgian Congo

OQ5IG	A	72,820	229	39	71	B

Canary Is.

EA8BF	A	273,760	642	50	95	A
EA8BK	A	24,220	234	14	21	—

Eritrea

ET2KY	A	165,945	490	34	81	C

Kenya

VQ4CC	21	14,736	141	21	32	B

Liberia

EL1K	21	25,175	141	21	32	B

Morocco, French

CN8JX	A	973,912	1219	79	189	B
CN8LM	A	221,793	618	36	85	—

Morocco, Spanish

EA9AP	A	151,250	459	34	76	B

Mozambique

CR7IZ	A	12,564	187	32	35	B

Nigeria

ZD2GWS	A	57,344	302	22	42	B
ZD2GUP	A	7,068	66	18	29	—

Rhodesia, So.

ZE1JV	A	368,514	706	59	118	—
ZE1JN	A	98,273	339	38	63	—
ZE5JE	A	36,490	140	37	52	B

South Africa

ZS1O	A	759	23	7	4	B
ZS6APO	21	43,550	230	23	42	B
ZS5DE	14	113,025	510	28	47	B
ZS6AJQ	14	31,447	182	2[illegible]	36	B

Tanganyika

VQ3CF	14	66,612	369	22	39	B

ASIA

Aden

VS9AS	21	69,040	300	26	54	B

Burma

XZ2TH	14	79,200	327	29	61	B

Cyprus

ZC4PN	A	92,018	221	40	103	B

Hong Kong

VS6BJ	A	24,682	128	36	51	B
VS6AE	A	19,521	102	31	50	B
VS6DS	A	7,067	85	16	21	A
VS6EA	14	2,808	56	11	15	A

India

VU2RM	A	56,088	185	45	69	A
VU2BK	A	7,810	62	27	28	A
VU2AJ	14	44,460	225	28	50	B
VU2CK	14	17,992	145	21	31	B

Japan

JA1VX	A	546,410	896	74	128	D
JA5AI	A	218,004	537	55	93	C
JA2JW	A	204,798	414	77	97	B
JA7AD	A	172,992	441	55	81	B
JA1BF	A	155,448	366	68	85	A
JA3JM	A	89,010	276	51	64	A
JA0FZ	A	43,848	216	31	41	A
JA3UI	A	31,506	134	41	48	B
JA1BSO	A	30,876	145	40	43	A
JA1BCO	A	16,284	94	33	36	A
JA1LN	A	10,816	119	15	17	B
JA3CS	A	5,883	46	25	28	B
JA3IS	28	87,685	423	24	47	B
JA3GM	28	69,679	399	25	34	B
JA1EC	28	32,704	209	22	34	B
JA2YT	28	30,772	215	19	30	A
JA3AA	28	29,432	195	19	33	B
JA1CC	28	19,530	149	18	27	B
JA1AFF	28	4,110	49	14	16	B
JA8AQ	21	42,932	188	29	55	B
JA1AS	21	22,320	131	25	35	B
JA2BL	21	14,256	88	24	30	A
JA8AA	14	90,885	402	29	54	C
JA1AA	14	48,600	242	28	47	B
JA2DN	14	30,528	159	26	46	C
JA8AH	14	21,650	153	21	29	C
JA9AA	14	17,169	111	25	34	C
JA1AG	14	17,050	113	22	33	C
JA1AB	14	6,300	51	20	30	B
JA2WB	14	5,764	57	20	24	A
JA1ZF	14	3,990	50	16	26	A
JA6TA	14	1,118	21	11	16	B
JA3TR	14	110	5	5	5	A
JA8FO	7	198	13	3	3	A

KA2BE	A	151,656	584	37	52	D

Laos

XW8AM	14	14,105	101	25	40	C

Lebanon

OD5LX	A	159,390	338	47	114	B

Mongolia

JT1AA	A	61,360	300	33	47	B
JT1YL	14	3,358	63	11	12	B

Ryukyu Is.

KR6AK	A	260,736	552	65	103	B
KR6BF	21	17,888	126	23	29	B
KR6FZ	14	459	9	8	9	—

Taiwan

BV1USB	A	31,995	203	35	46	B

Thailand

HS1C	14	155,610	624	31	59	C

U. S. S. R., Asiatic

UA9DN	A	718,270	863	87	223	B
UA9CL	21	27,434	178	18	40	C
UA9DM	14	9,766	90	12	26	A

EUROPE

Aland Island

OH0NC	A	236,165	699	44	105	B

Austria

OE1RZ	A	180,238	345	73	154	C
OE1HV	A	38,778	195	37	101	B
OE8SH	A	26,300	129	31	69	B
OE1LM	A	19,300	122	28	72	B

Azores

CT2BO	A	11,455	151	10	19	—

Belgium

ON4SH	21	15,288	106	20	36	—
ON4IX	14	16,005	177	16	39	B

Bulgaria

LZ1AF	14	6,806	100	10	31	B

Corsica

F9QV /FC	A	177,642	593	43	99	B

Czechoslovakia

OK1FF	A	573,352	819	85	213	D
OK3DG	A	245,622	602	64	137	B
OK3AL	A	221,000	703	51	149	B
OK3EA	A	205,516	493	57	151	B
OK1AEH	A	125,097	433	43	104	B
OK1KDR	A	100,832	320	38	99	—
OK2BMP	A	31,680	238	22	77	B
OK1WR	A	30,226	179	30	97	B
OK1KDC	A	17,812	110	28	45	B
OK1EV	A	12,936	118	24	53	—
OK1AJB	A	12,675	133	20	24	B
OK1VE	A	11,152	154	15	67	B
OK2WL	A	8,914	94	18	25	—
OK1ZW	A	8,464	81	23	41	—
OK2KGZ	A	2,849	47	15	22	B
OK1AHN	A	1,496	40	10	24	A
OK3KHE	A	897	32	6	17	B
OK1AC	28	35,040	221	23	37	B
OK1MP	28	3,875	56	11	20	B
OK1LM	21	105,800	408	28	72	—
OK1PD	21	68,121	338	26	61	B
OK1KHK	21	19,719	162	17	63	B
OK1US	21	3,390	53	11	19	B
OK1KKR	14	64,815	361	25	62	—
OK1AWJ	14	53,118	338	20	58	D
OK1JX	14	33,337	230	20	49	B
OK1UK	14	18,656	194	15	38	B
OK1SV	14	11,256	92	17	39	B
OK2KJ	14	1,770	45	7	23	B
OK1ZL	7	25,630	354	10	45	B
OK3EE	7	14,416	201	11	42	—
OK1ZU	7	7,314	136	10	36	A
OK1GO	7	4,185	114	7	28	—
OK3IR	7	3,164	141	5	23	A
OK1KKS	7	1,792	59	5	23	—
OK1MG	3.5	10,710	230	7	38	B
OK1ZA	3.5	5,850	161	6	33	B
OK3KEW	3.5	2,588	89	6	23	A
OK1KPP	3.5	2,392	49	4	13	A
OK2IK	3.5	2,340	72	5	25	—
OK2KBA	3.5	1,860	97	3	17	A
OK3KEE	3.5	1,575	65	4	21	—
OK3QA	3.5	608	35	3	16	—
OK1NW	3.5	130	15	3	7	A
OK2NR	1.8	279	33	2	7	A

Denmark

OZ7BG	A	174,400	363	73	127	C
OZ3SN	A	20,241	186	14	25	B
OZ7BW	A	4,386	76	11	30	—
OZ3GW	28	1,978	32	11	12	B
OZ4RT	21	34,894	233	19	54	B
OZ6HS	21	6,690	113	9	21	B
OZ5KQ	14	5,068	85	11	17	C
OZ2NU	7	3,842	102	6	28	—

Eire

EI9V	A	122,208	410	40	94	B

England

G2DC	A	358,570	631	66	164	B
G3KKP	A	291,332	659	55	118	B
G3BTA	A	238,602	544	59	102	—
G2VD	A	152,000	435	45	115	B
G2HPF	A	129,630	358	54	120	B
G2AJB	A	85,120	278	47	105	B
G8DI	A	58,995	261	33	82	B
G6VC	A	55,625	274	29	60	B
G3KRC	A	39,346	252	22	73	B
G3JVU	A	14,846	114	31	71	B
G5JL	A	7,968	88	15	33	B
G2CIL	A	1,196	36	5	21	A
G3MWZ	A	950	26	8	17	B
G3WP	28	3,087	56	9	12	B
G3DNX	14	5,427	105	7	20	—
G4CP	7	60,310	404	19	55	B
G5RP	7	24,924	221	15	47	B
G3EYN	7	22,734	252	10	44	B
G3ESF	7	9,372	153	8	36	—
G3MPY	7	2,016	57	6	22	B
G5MP	1.8	40	6	2	6	A

Faroes Island

OY7ML	A	5,192	72	17	42	—

Finland

OH2HK	A	365,820	585	71	197	B
OH2MQ	A	156,524	399	58	160	B
OH2LA	A	64,782	240	39	83	—
OH2RW	A	49,678	206	36	82	B
OH5OV	A	38,413	234	25	82	B
OH2FT	A	34,463	174	33	110	B
OH2KQ	A	33,221	147	42	97	B
OH7AA	A	31,866	167	39	74	B
OH2LP	A	26,376	205	21	63	B
OH3UO	A	16,924	122	24	60	B
OH8ND	A	6,944	84	19	43	B
OH2RD	A	3,381	40	19	30	
OH3TI	A	2,350	30	18	29	
OH3RA	A	924	26	9	1	
OH3TQ	A	528	13	8	8	
OH3RU	28	25,596	155	24	5	
OE9PP	28	18,352	145	19	4	
OH6RC	28	17,934	118	19	42	
OH8QA	28	3,441	52	12	25	
OH5RH	21	57,226	343	20	5	
OH5NJ	21	51,744	256	26	58	
OH3TY	21	16,353	122	19	50	
OH5NF	21	14,063	131	14	2	
OH2YH	21	9,328	84	16	28	
OH5RZ	21	1,508	36	9	1	
OH1SN	14	43,043	214	25	52	
OH2AA	14	42,194	315	19	54	
OH8OA	14	36,192	250	17	43	
OH3TH	14	23,247	179	19	4	
OH2HW	14	18,602	118	21	50	
OH9PF	14	13,272	104	16	40	
OH1TI	14	10,416	108	14	34	
OH2IZ	14	7,965	106	12	33	
OH8PJ	14	3,844	61	11	20	
OH2JF	14	2,494	50	8	2	
OH7PR	14	820	36	6	1	
OH2IK	14	624	20	6	1	
OH5OV	14	13,034	158	12	3	
OH7NF	7	11,664	182	11	3	
OH2YV	7	5,904	94	11	37	
OH2MA	3.5	4,290	136	5	2	
OE2XK	3.5	3,000	104	5	2	
OH2KA	3.5	1,111	61	3	1	

France

F9MS	A	234,969	581	57	14	
F8TM	A	121,030	279	53	13	
F9GL	A	101,456	320	43	9	
F9BB	A	65,930	259	28	6	
F8TQ	A	28,028	130	24	5	
F3GL	A	7,700	64	15	1	
F3MB	A	2,296	36	16	2	
F9DW	A	1,863	31	11	1	
F8DF	A	243	11	4		
F2ZB	14	7,084	99	13	3	
F3BE	14	3,740	67	6	1	
F9CE	14	3,627	63	8	2	
F7CV	14	29,865	261	14	4	

Germany

DL7AA	A	440,180	661	82	17	
DL7BA	A	355,046	582	81	14	
DL7CW	A	259,676	496	61	15	
DL3LU	A	219,450	420	72	13	
DL7DF	A	187,275	364	69	15	
DJ1ZN	A	115,292	316	44	10	
DL7AD	A	86,240	227	62	9	
DJ2KU	A	61,056	279	36	9	
DJ4DN	A	57,572	213	38	9	
DJ2CS	A	46,355	207	39	8	
DL3DD	A	39,270	139	36	8	
DJ4SO	A	37,040	203	26	5	
DL1TH	A	34,144	170	34	5	
DL1CO	A	32,591	164	36	7	
DL6NW	A	26,532	136	35	6	
DJ2SK	A	26,264	148	27	7	
DJ1UE	A	22,120	135	25	5	
DM3KBL	A	18,120	298	12	2	
DL6CL	A	14,616	108	22	6	
DL1ES	A	13,940	113	24	6	
DL7BQ	A	11,275	106	18	3	
DJ4FZ	A	10,251	106	19	4	
DL1NC	A	9,160	90	18	2	
DL6JD	A	8,740	86	20	2	
DL6EY	A	8,142	65	15	3	
DJ2JI	A	7,350	100	12		
DL3DQ	A	4,450	55	15		
DJ2SL	A	4,320	62	17	4	
DL1XS	A	2,352	51	11		
DJ2DG	28	6,669	61	19	2	
DJ2IV	28	3,425	53	10	1	
DL1LZ	28	1,056	22	5	1	
DJ2RE	28	686	98	4		
DL9OL	28	75	5	5		
DL9BG	21	8,729	82	15	2	
DJ2MN	14	175,960	604	29	7	
DJ2LM	14	100,782	419	28	7	
DL6WD	14	82,175	379	26	6	
DL1XZ	14	24,552	190	14		
DL6DE	14	13,700	116	15		
DJ4KU	14	11,076	104	16		
DJ4AN	14	6,596	92	11		
DL9ZE	14	4,620	67	11		
DL9LX	14	4,321	101	5		
DL6KC	14	4,182	72	12		
DJ1HJ	14	1,525	44	6	1	
DL1FF	7	42,768	284	17	5	
DL1KS	7	13,052	192	12		
DJ3GE	7	3,774	96	7		
DJ3WE	3.5	8,360	193	7	3	
DJ1VC	3.5	4,828	131	5		
DL1JW	3.5	3,162	91	5		
DJ4DRA	3.5	380	20	4		
DJ3VC	3.5	209	19	3		
DL1YA	1.8	128	17	2		
DL4WA	A	5,824	55	23		

Greece

SV0WP	A	878,853	1384	77	1	
SV0WY	21	30,388	263	22		

ungary

5AM	A	109,802	429	41	113	B
5DU	A	96,268	269	52	112	B
5BG	A	80,256	325	37	91	B
5DH	A	63,011	300	39	92	B
5BI	A	44,478	222	38	88	B
0HN	A	42,594	306	23	70	B
1SP	A	7,865	105	14	41	B
6NC	A	1,540	52	8	20	A
7PZ	7	7,821	213	9	24	A

eland

3AB	A	87,360	421	25	55	B

aly

IT	A	305,802	628	52	137	C
CN	A	40,788	193	30	73	B
R	A	1,275	25	10	7	—
LU	28	27,500	247	18	25	B
EK	28	6,996	54	15	29	B
NU	21	28,050	182	19	47	—
Q	7	9,065	178	7	30	B

etherlands

0LZ	A	598,023	790	92	229	B
0RE	A	593,424	809	91	226	B
0LOU	A	368,784	667	67	141	B
0VB	A	351,670	627	78	152	B
0TAU	A	252,406	480	77	165	—
0BW	A	109,368	271	62	155	B
0VDV	A	59,694	246	35	84	B
0YN	A	35,604	173	34	58	B
0TWJ	A	32,550	101	30	75	B
0CF	A	15,543	85	10	59	B
0IP	A	6,912	257	6	30	
0CE	A	5,890	66	18	20	B
0RZL	A	2,916	54	10	8	B
0LY	A	1,721	33	9	10	A
0NW	28	8,295	90	15	20	B
0SNG	21	11,340	114	13	29	B
0PRF	21	7,360	95	10	22	B
0UKG	14	12,221	150	10	39	B
0PUY	14	8,856	109	14	27	—
0VY	14	8,100	109	10	20	B
0NIC	7	11,891	171	11	36	—
0HOR	7	6,626	128	7	31	—
0LV	3.5	7,448	196	5	33	A
0TA	3.5	3,488	53	6	26	B

orthern Ireland

3IVJ	A	243,162	596	52	119	B
IGB	A	170,361	341	19	38	B

orway

1K	A	248,198	724	46	147	B
6CF	A	139,426	418	44	117	B
5UF	A	64,294	171	31	91	—
8ZC	A	63,063	297	30	87	A
4ZC	A	27,025	195	24	23	—
6U	A	12,663	75	21	42	—
6V	A	9,405	77	21	24	—
2HC	A	7,668	97	14	13	—
4R	A	360	20	5	1	—
2B	A	234	8	7	8	—
3SG	28	6,552	84	11	17	—
7Z	21	36,366	270	22	44	B
1LE	21	30,408	224	17	39	—
3UE	21	6,580	80	9	26	B
4RG	21	1,334	44	6	17	—

land

3PL	A	220,782	521	59	127	B
5AR	A	187,572	531	54	149	C
RT	A	68,888	310	37	121	A
5AA	A	31,005	191	32	85	—
EU	A	26,598	134	29	64	B
6WM	A	26,386	223	24	55	B
ET	A	7,654	92	15	28	A
8XE	A	858	27	7	15	A
9DT	A	388	14	6	8	B
2DX	28	85,936	381	29	53	C
3AK	28	23,895	160	22	37	C
2AD	28	20,812	177	15	29	B
3PK	28	13,815	121	17	28	C
2EQ	28	11,205	105	17	28	B
3SQ	28	3,151	52	10	13	B
6JU	28	336	28	3	1	B
3PH	21	20,852	192	16	36	C
6LB	21	6,845	76	11	26	B
8MJ	21	946	31	7	15	B
4JF	14	64,792	364	29	62	—
8AG	14	42,997	346	20	53	B
8HU	14	39,042	272	24	57	B
1KHA	14	24,408	228	13	41	C
8HR	14	18,849	207	15	46	A
3KAU	14	16,269	190	13	38	C
8KBM	14	6,640	115	12	28	B
5ZA	14	3,192	58	9	27	B
2GS	14	3,168	67	9	23	B
2OE	14	3,131	59	10	21	A
SP1KBK	14	810	24	7	8	C
SP9KAO	14	288	14	6	6	C
SP7JX	7	12,195	226	8	37	A
SP6YC	7	3,795	105	6	27	A
SP9KAD	7	988	50	5	14	B
SP3OZ	7	714	42	6	15	A
SP2IW	7	648	34	5	13	B
SP4WG	7	165	19	2	2	—
SP2IU	7	8	2	2	2	—
SP5IA	3.5	6,125	170	7	28	C
SP6UN	3.5	3,099	130	5	21	A
SP2CO	3.5	1,748	83	1	3	B
SP1VW	3.5	975	71	3	12	A
SP3SI	3.5	56	13	3	4	A

Roumania

YO3AC	7	2,520	62	8	27	B

Scotland

GM3FJP	A	88,150	409	26	60	B
GM8SQ	A	42,813	251	26	45	B

Spain

EA4GA	A	241,080	623	49	119	B
EA1AB	A	118,483	521	36	73	C
EA7EW	A	101,016	429	31	61	A
EA1CP	A	84,708	428	26	52	C
EA1EG	A	13,821	118	19	22	—
EA2CR	28	6,479	110	9	22	B
EA3LA	28	1,560	40	7	13	—
EA3KT	21	6,747	100	12	27	B
EA5FU	14	5.359	79	8	15	A

Sicily

IT1TAI	14	196,911	748	31	86	B
IT1AGA	7	7,920	129	8	36	B

Spitzenberg

LA2JE /P	A	2,813	79	9	23	B

Sweden

SM3AKW	A	375,380	573	79	195	C
SM5DW	A	286,118	539	61	153	C
SL3AG	A	127,698	430	39	98	B
SM5CZD	A	38,142	212	32	85	B
SM7EH	A	34,917	183	32	71	B
SM5BPJ	A	29,355	148	32	63	B
SM4AEQ	A	24,648	122	34	44	C
SM3AU	A	18,360	123	23	49	B
SM7CNA	A	17,670	134	20	37	B
SM6AMN	A	6,804	98	12	30	C
SM7MS	A	5,106	43	21	25	—
SM5UU	A	1,998	33	6	21	B
SM7ID	28	58,289	271	24	53	B
SM3AKM	28	51,520	274	24	56	B
SM5DX	28	4,920	65	11	30	—
SM5KV	21	43,216	289	25	54	A
SM5AJU	21	42,450	241	22	53	C
SM4KL	21	12,948	146	11	28	—
SM5BFE	21	7,454	100	16	42	B
SM5CCE	14	170,607	595	32	79	—
SM4DN	14	127,008	423	32	80	—
SM3AGD	14	58,588	248	28	69	C
SM5CXF	14	45,990	236	25	65	C
SM6AMR	14	40,392	315	16	50	—
SM6BOU	14	34,190	208	20	45	B
SM5AHL	14	32,571	203	19	44	—
SM7TQ	14	32,193	202	20	53	C
SM5ATK	14	28,408	203	21	32	- -
SM5AEJ	14	25,996	183	18	49	B
SM5BRS	14	23,498	221	15	47	—
SM3AF	14	10,880	121	12	28	—
SM3ACP	14	8,844	130	11	33	-
SM5BMB	14	7,268	130	10	36	B
SM5BP	14	4,992	65	12	27	-
SM7AFK	14	3,224	47	9	22	C
SM5AIO	14	2,889	57	8	19	- -
SM5AGU	14	810	29	5	10	—
SM7CAB	14	100	6	5	5	—
SM5BIC	7	12,000	166	13	35	C
SM6CRA	7	4,958	124	8	29	B
SM7CNF	7	3,783	94	9	30	—
SM5BJO	7	3,627	82	8	31	—
SM5BWC	7	1,150	40	5	20	A
SM5AFN	7	1,100	46	6	14	B
SM6CU	3.5	3,480	119	4	26	B
SM5UQ	3.5	2,040	89	4	20	B
SM1CPB	3.5	2,002	97	3	19	B
SM6JY	3.5	1,134	55	4	17	B

Switzerland

HB9QR	A	562,565	764	95	200	C
HB9QO	A	130,936	346	54	110	B
HB9MO	A	128,355	335	62	137	C
HB9EQ	A	43,780	288	24	86	B
HB9UB	28	3,600	51	10	15	—
HB9QA	7	8,820	144	7	35	B
HB9KC	3.5	5,191	143	5	24	B
HB9NL	3.5	465	16	5	10	C

U. S. S. R.

Estonia

UR2BU	A	102,521	344	47	110	C
UR2AO	28	21,120	184	14	34	B
UR2DX	7	5,049	141	7	26	B

European

UA4IF	21	17,889	136	25	42	C
UA3XN	3.5	2,028	82	4	22	A

Georgia

UF6FB	A	26,964	116	30	54	B
UF6DD	7	3,625	52	6	19	B

Latvia

UQ2AS	A	175,440	596	47	125	—

Lithuania

UP2AT	A	111.605	566	24	61	A

Moldavia

UO5AA	A	69.368	356	34	82	C

Ukraine

UB5WF	A	565,701	910	89	214	C
UB5TV	14	25,926	245	14	44	B

Wales

GW2DUR	14	19,425	225	10	27	B

Yugoslavia

YU3OV	A	93,312	382	39	105	B
YU3OS	A	63,210	332	35	94	B
YU1SF	A	26,544	213	20	64	A
YU1DVW	3.5	1,334	58	4	19	A

OCEANIA

Australia

VK2GW	A	354,172	627	76	120	B
VK2PV	A	54,752	175	48	68	B
VK2AKF	A	17,020	156	21	16	B
VK2APK	14	31,659	189	23	38	B
VK2OW	14	741	13	9	10	—
VK3CX	14	19,836	102	21	36	B
VK3XB	7	9,604	120	14	14	B
VK4BG	21	23,580	132	23	37	B
VK4XW	7	3,179	64	9	8	B
VK5NO	A	217,308	420	75	107	—
VK5JT	21	2,709	44	12	9	B
VK5MY	14	22,320	113	23	49	B
VK6RU	A	476,720	700	85	151	B
VK7UW	A	119,500	347	53	72	B
VK7JB	A	30,537	133	34	47	B
VK7KA	21	10,764	69	24	28	—

Cook Island

ZK1BS	A	166,632	424	60	71	B

Fiji Islands

VR2DG	A	118,048	381	49	63	A

Hawaii

KH6IJ	A	767,856	1279	82	122	D
KH6AYG	A	471,702	1033	65	89	—
KH6DS	28	11,985	246	9	8	B
KH6CJJ	21	51,000	352	22	29	A
KH6KC	14	105,336	416	29	59	D
KH6MG	14	105,030	397	29	61	D
KH6PM	14	10,010	62	26	39	C

Lord Howe Island

VK3ARX /LH	14	1,320	26	10	10	B

Mariana Islands

K6TSQ /KG6	14	16,400	125	21	29	B

Marshall Islands

KX6CW	A	183,690	549	52	65	C
KX6AF	14	8,650	117	11	14	C
KX6AF	3.5	1,720	44	9	11	C

Midway Island

KM6BL	A	229,197	967	38	41	C

New Caledonia

FK8AS	14	5,400	60	13	17	B

New Zealand

ZL1MQ	A	84,357	288	48	55	B
ZL3OB	A	68,448	270	43	53	B

Niue Island

ZK2AD	14	15,741	117	23	30	B

Paupa Territory

VK9XK	A	88,020	297	47	61	B

Philippine Islands

DU7SV	A	117,160	411	50	51	C

SOUTH AMERICA

Argentina

LU5AQ	14	14,271	76	22	45	C

Brazil

PY4OD	A	168,432	435	47	85	—
PY1HQ	A	9,219	147	9	12	C
PY7ADR	A	3,848	50	12	11	—
PY4AO	14	51,148	228	29	47	C

Chile

CE3AG	A	738,465	922	93	180	D

Paraguay

ZP5JP	A	6,716	52	24	22	C

Peru

OA4FA	A	66,436	331	31	37	C

Uruguay

CX2CO	A	668,388	1036	77	142	D
CX2BT	A	64,965	309	27	44	—
CX1FB	A	28,152	204	24	22	B
CX1BZ	14	40,356	236	24	35	B
CX1DZ	14	4,635	103	8	7	B
CX6AD	14	1,600	55	6	4	B

Multi Operator

NORTH AMERICA

United States

W1TSL
14 28,512 288 28 71 C
(W1TSL—W1YNP)

K2GL
AB 2,009,280 1536 133 322 D
(K2GL—W2HQL—W2IWC)
(W2GLM—W2DEC—K2TXC)

W2JT
AB 395,776 520 82 174 D
(W2JT—W2ZGB)

W2HTI
AB 343,710 442 89 196 D
(W2HTI—K2EB)

W3AOH
AB 946,854 897 115 254 D
(W3MVQ—W3UHN—W3VKD
—K3DKD)
(W3AOH—W3LMM—W3QJJ)

W3WV
AB 474,048 588 86 202 D
(W3WV—KB6BJ/3)

W3FYS
AB 383,829 471 91 200 D
(W3FYS—W3TMZ/3
—W6HOH/3)

W3BYX
14 17,688 99 28 43 C
(W3BYX - W3DAO)

K4NCN
AB 16,863 88 28 49 D
(W4KXV—W1DDV)

W4KFC
14 187,724 460 38 104 B
(W4KFC—K4OKZ)

W5IAH
14 79,116 245 33 81 D
(W5IAH—W5OSW—K5KWC)

W6YMD
AB 1,375,725 1070 140 295 D
(W6OZ—W6MUR—W6KFV
—W6YMD)
(K6EWL—W6GHM—W6FUF)

[Continued on page 101]

In The Beginning

F. D. Whitmore, W2AAA
223 W. Holly Ave.
Pitman, N. J.

Part IV

Coherers finally disappeared in favor of the electrolytic detector but it soon became evident that they needed something better for receiving than the single coil with one slider.

Loose Couplers

Claims for the loose coupler caught BG's eye, and this time he decided to go all the way. Besides primary and secondary coils with variable coupling, each circuit was to have a variable condenser. Again, the loose coupler job would be homebrew. The circuit is shown in fig. 14.

This time they kept their coil winding on safer ground; neither coil required a rolling-pin core.

Winding of the primary coil started with a large tomato can. Over the can they wrapped string and applied a coat of shellac. When dry, they wrapped several layers of brown paper over it again applying shellac. Next came the wire and another treatment of shellac. The can remained in until the coil dried, then it was forced out.

For the smaller secondary coil that was to slide inside the primary, they started off with a corn can. They followed the same technique that was so successful for the first coil. This time, however, a slight incident crept in. Up to the point of winding the coil, everything went well. But working with #24 wire proved more delicate than handling #18.

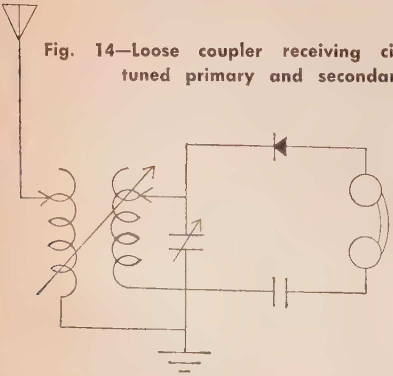


Fig. 14—Loose coupler receiving circuit with tuned primary and secondary.

It being cold weather, the coil winding took place in the kitchen where a coal range kept it warm. Walt sat in a chair turned backward holding the spool of wire. The wire passed across the chair back and over to another chair where his father sat turning the coil form.

At the halfway point the coil looked fine. The winding was even and without overturns. Only forehead perspiration indicated the strain this delicate task imposed on them. Tiring hands and aching fingers made each turn a little harder. As each became aware of tiring, his tension increased. Suddenly, the coil slipped out of his father's hands and do it yourself enthusiasim dropped a couple of decibels.

No further incidents marred construction of the loose coupler. It remained the best receiver in the shack seeing action until World War I.

Wireless Inventions and Developments

During the next two years this one inch spark created plenty of interference in the local atmosphere. It never conquered great distances, but it did provide much fun and learning for the local gang.

Though spending considerable time on the air, Walt and his brother Hal also kept their ears tuned to the times noting the progress and trend in wireless. They watched the up-and-down struggle of numerous inventors seeking supremacy or an edge over the others through their latest invention.

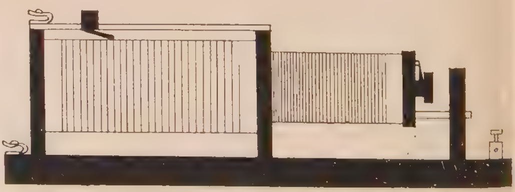


Fig. 15—Construction of loose coupler

Fessenden, the inventor of the electrolytic detector concentrated on wireless telephony. His experiments with the high frequency mechanical alternator produced good results. Ultimate perfection of the alternator came with Alexanderson's design using metal in place of Fessenden's wooden rotor construction. In 1907 Alexanderson's design, producing undamped waves of 100,000 cycles at 2 *kw* power, experienced great success in conquering distance.

Fessenden next produced an innovation in spark transmitters with his invention of the rotary spark. Its clean high note penetrated static many times better than the fixed gap sparks.

Fessenden produced another great invention in 1905. At that time he invented the heterodyne receiving system. However, the invention came before he had suitable equipment to exploit it. It took discovery of the oscillating tube to provide the principal means for proving it the best of reception methods. Major Armstrong constructed his superheterodyne system upon it six or seven years later when the audion tube of deForest became available to the general public.

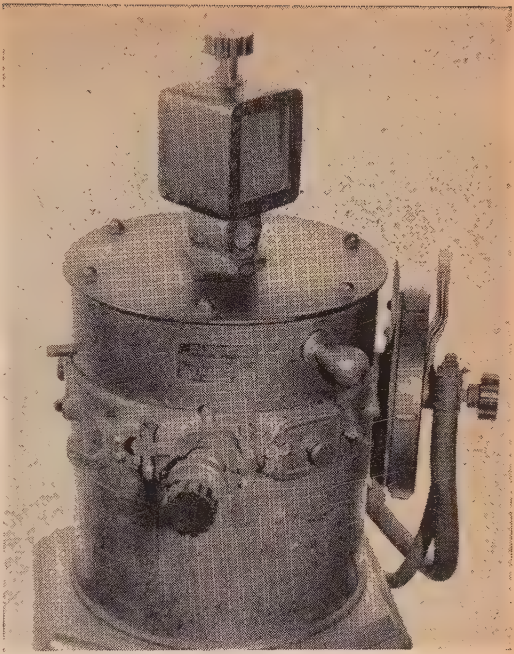
DeForest, after losing litigation to Fessenden over the electrolytic detector, turned his attention to Fleming's two element tube based on the "Edison effect." He added a third element, the grid, and produced enormous amplifications of radio currents. This invention occurred in 1906. Sued again, he lost this suit to Fleming. He retained, however, amplifying rights which he later sold to the American Telephone Company for $50,000.

In 1907 deForest conducted extensive experimental telephony broadcasting in New York between buildings three blocks apart. These broadcasts had a good amateur following. Later that year he installed wireless telephone on a private yacht cruising in Lake Erie. The U. S. Navy promptly installed two sets. Though voice transmission reduced distance to a few miles, when the U. S. Fleet cruised around the world in 1907, over twenty vessels were equipped with deForest radiotelephone.

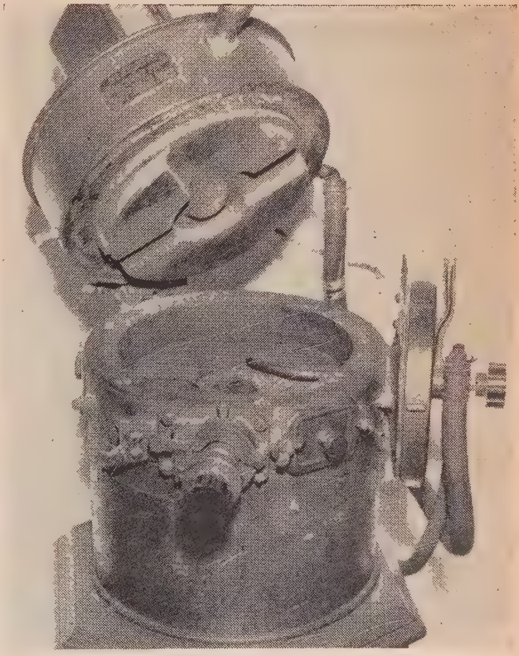
DeForest broadcast telephony from the Eiffel tower in 1908. The signals reached Marseilles five hundred miles away. Back in America in 1910, he broadcast the Metropolitan opera performance of Cavalleria Rusticana and Pagliacci.

Fessenden conducted telephony experiments using his mechanical altenator at frequencies from 50,000 to 100,000 cycles. DeForest's equipment for music and voice transmission used an arc transmitter to supply the continuous wave carrier.

An Englishman, William D. Duddell, found that an electric arc would generate continuous frequency electric energy. The tone from the 10,000 cycle oscillations he produced earned it the nickname "singing arc."



US Navy arc converter with closed chamber. Courtesy of Henry Ford Museum, Dearborn, Michigan.



US Navy arc converter with chamber opened showing the electrodes. Courtesy of Ford Museum, Dearborn, Michigan.

Valdemar Poulsen of Denmark applied the "singing arc" to wireless transmission. His improvements raised the possible frequency of an arc up to several million cycles per second with great amplitude. He transmitted voice over appreciable distances with it in 1904.

The successful radiotelephony arc burned in hydrogen or gas containing hydrogen. A cup on top of the arc chamber held a supply of alcohol which dripped into the arc chamber and vaporized.

Copper formed the positive electrode. Water circulated in its hollow area to cool it. The negative electrode was carbon. To improve the regularity of oscillations, the carbon electrode slowly revolved about its axis.

The arc burned in a transverse magnetic field. Two iron cores with direct current flowing through their windings provided the magnetic blow-out of the arc. A means for momentarily pushing one electrode against the other, (striking the arc) started the arc burning.

A direct current flowed through the magnetic coils and the electrodes (See fig. 18) and formed the arc. A circuit containing inductance and capacitance shunted the electrodes and caused the undamped oscillations. A choke coil kept the radio frequency current out of the dc circuit.

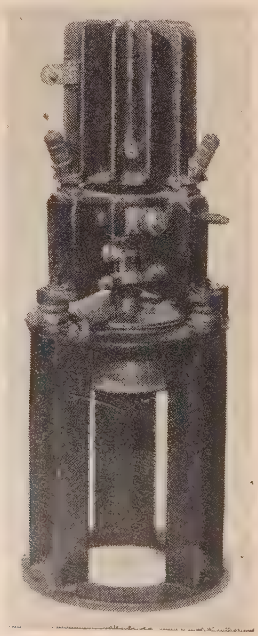
The voltage across the arc reached the condenser through the coil causing it to start charging. All the dc current didn't go through the arc — some of it flowed in the LC circuit. Since the dc supply was a constant source of energy, current used to charge the condenser decreased current flowing through the arc. A decrease in current through the arc caused a rise in voltage difference between the electrodes and therefore across the LC circuit. The increased voltage further increased the chargin rate of the condenser.

When the condenser was fully charged, th current flow in the circuit stopped and the ar current increased since the supply current n longer divided between the two circuits. Increased arc current resulted in a decrease i the potential at the arc electrodes, and there fore also across the LC circuit. Now the condenser began discharging through the arc increasing the arc current and further reducin the voltage across the electrodes. When th condenser was fully discharged, the condense charging cycle repeated.

By placing a choke coil in the dc field an shunting it with a microphone, sound wave were superimposed on the radio frequenc oscillations. These feeble current variation had their influence and modulated the heav arc currents. The same result occurred if th microphone was placed in the antenna circui

Arcs were not limited to telephony; the could work in telegraphy too. For the latte purpose a small inductance placed in the antenna circuit made the frequency slightl higher than wanted. A telegraph key shorte out a few turns on the coil thus slightly alterin the transmitted wave to the desired frequency

Along with the professional experimenters some amateurs experimented with arcs too. I the period 1909 and 1910, detailed instruction appeared in current periodicals for constructin amateur voice transmitters using arcs.



Poulsen arc converter. Courtesy of Henry Ford Museum, Dearborn, Michigan.

Crystals Detectors

During ths period of telegraphy and telephony progress, one of the biggest boons t amateur radio occurred. General Henry C Dunwoody of the U. S. Army invented th crystal detector. He discovered in 1906 tha carborundum (carbide of silicon) would detec electric currents. At about the same time, G. W Pickard found that silicon worked very well too Lead ore (galena) and iron pyrites also becam popular.

Crystal detectors were simple and inexpensive. No amateur's finances suffered by acquiring one. In a flash these detectors invaded th amateur fraternity. They were almost as sensi

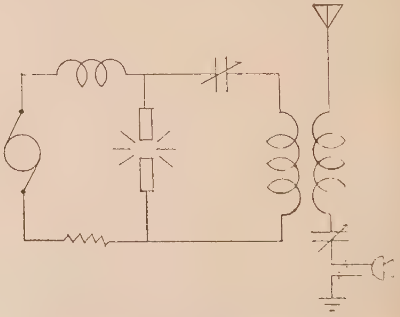


Fig. 16—Schematic of arc transmitter used for telephony.

ve as liquid detectors and had ease of manipu- tion and cheapness in their favor.

Wireless boomed. This simple device brought ther voice or code into the home. Those not uite able to master Morse code had another oice — music and voice. These interested a r greater audience than code alone. Amateur nks swelled. Capturing these thrilling sounds om the air enthralled parents as well as boys. oth fiddled with tuning gadgets far into the ee morning hours.

Walt Goes to Sea

In 1910 Walt became a neighborhood hero. e was going to sea.

Announcement of the wireless operating as- gnment brought various reactions at home. is younger brothers looked at him with awe. is father's delight gushed forth for hours with les of his own sea experiences. Walt himself as walking on air: One moment he envisioned mself receiving the SOS that changed his ip's course and sent her dashing ahead full eed to the rescue; again, his ship was flound- ring while he desperately signalled for help; ways, only he possessed the miraculous touch bring or seek aid.

Walt got this job through an agency. Though nly a relief run for a sick operator, this trip rom Philadelphia to the Sabine for Texas oil eant as much to Walt as an Orient run to a regular."

Amid intimate goodbyes and best wishes, alt slung a leg over the side. Using the an- nna lead-in for a bearing, he headed with his itcase for the wireless shack.

When he reappeared on deck, lines had been ist off and sailors were hauling them aboard. etween Walt and the pier, where his family ood waving, spread an ever widening expanse water. All at once Walt's hero dreams van- hed. He felt alone and scared. A feeble wave those on shore was the best he could manage.

The first shock of being alone passed, and alt re-entered his cabin to explore the wire- ss gear while the SS Sun put distance between self and Marcus Hook, Pa.

He found both his bunk and the rig in the small cabin. A shelf over his bed held part of the equipment. The remainder consisting of the key and receiver glistened attractively from the operator's table.

The open spark transmitter seemed like a giant after his one inch spark coil. This one would throw a spark ten inches. Walt gradually realized the distance possibility such power represented. As this realization sank in, his feeling of loneliness diminished. Soon, an eager desire to try out this power replaced the homesick twinge. Walt was passing his first test. He would be all right.

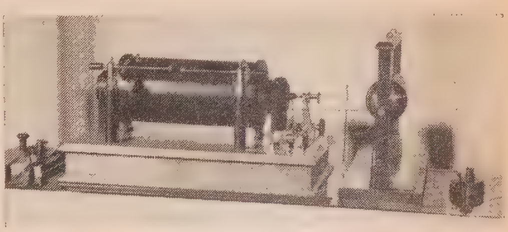
The "Old Man" (captain) issued one order to all his wireless operators: "Don't fail to get the baseball scores." This proved easy for Walt because the ship had a loose coupler receiver much like he used at home. Only the detector was different. This set used a crystal detector with carbonundum. At home, Walt still used an electrolytic. A few tests with this different detector and he was enthused. When he completed the voyage, a crystal detector replaced his electrolytic.

The next day Walt basked in sunshine on a sea that barely lapped the vessel's hull. As he gazed over the quiet water, he felt equal to any distress emergency that might arise. That night, he retired happy and confiident that the sea provided the only career for him.

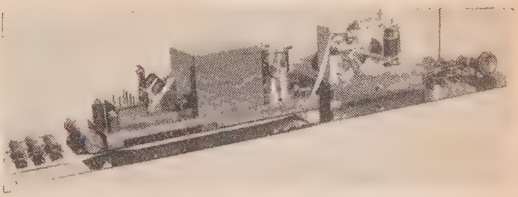
Over night a change in wind roughened the sea somewhat. Riding high with only enough water ballast to hold the bow down, the ship responded with a constant lazy roll.

At seven o'clock Walt bounded out of the bunk and reached for his clothes. Somehow the clothes kept moving a little beyond his reach while he staggered to keep his balance. With concentrated effort he dressed and headed for the dining salon and breakfast.

[*Continued on page 124*]



Open-spark inductance coil used about 1900 on early ship installations. Courtesy of Ford Museum.



Coherer receiver set-up as used by Marconi for first transatlantic messages. Courtesy of Ford Museum.

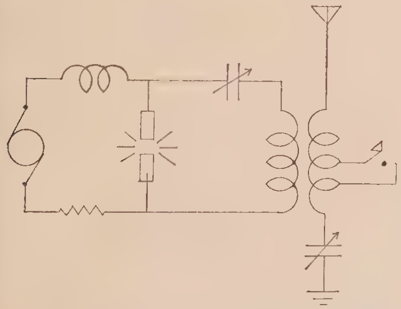


Fig. 17—Schematic of arc transmitter used for telegraphy.

New Life For That Old Receive

C. R. Thayer, W9LFO
Box 271, Greenview, Ill.

If I had a dollar for every time that I have heard the statement, "I'd like to get on ssb but I don't have the receiver for it and I can't afford to get a new receiver and also afford the ssb equipment," I would be a rich man. Having been on ssb for two and one-half years using an old surplus Super-Pro without any adaptors, product detectors, etc; in other words using the receiver in its original form, I feel that most people do not know how to get all out of a receiver that they could. As manufactured, most 'communications' receivers worthy of the name are very flexible and are capable of eliminating a lot of the QRM normally heard on the amateur bands. For instance, proper use of the crystal filter and *if* selectivity will enable the copying of a sideband QSO on one sideband with another QSO on the other sideband without difficulty. Most sideband transmitters do not have suppression in excess of 30 *db* and the measured suppression in my receiver using the method of tuning to be described shortly is in excess of 25 *db*, therefore quite adequate. I have had a toroidal filter in my receiver and removed it as it did not improve my ability to copy signals and was an extra 'gadget' to adjust.

For those of you then that are interested in receiving only one sideband at a time, or on cw elimination of the audio image, so-called 'single signal' reception, please sit down at your receiver and follow the following step-by-step procedure. Although you may not understand why something is done, follow the step-by-step procedure to its conclusion and an explanation will be given later.

Now at your receiver:

1. Turn the *avc* off, the audio gain full on, the *rf* gain down, and the cw oscillator on. (Otherwise known as the cw settings)
2. Now tune your receiver to some frequency on which there is only noise. This might be on the ten meter band when the skip is out, or perhaps you may have to disconnect the antenna. Advance the *rf* gain (sensitivity) till the noise is a comfortable volume.
3. Turn your crystal filter, or *if* selectivity, to its most selective position.
4. Vary the *bfo* pitch control back a
forth throughout its entire range. As y
do you should hear a peculiar variati
in the pitch of the noise, from a low pit
to a high pitch and back to low pitch w
an effect somewhat similar to 'zerobe
ing' but there will be no definite auc
tone. The point that we are interested
is that point at which the pitch of t
noise is lowest, which is the true ze
point on the *bfo* pitch control. Perha
the true zero thus determined will c
respond with the marked zero on yo
receiver but more likely not. If not y
may adjust the knob or the internal a
justment so that true zero correspon
with marked zero, or merely jot down t
true zero point on a piece of paper.
5. With the *bfo* at true zero and the r
of the controls set as they were, tune t
receiver to a steady unmodulated carri
This may come from your frequen
standard, a signal generator, the excit
stages of your transmitter, or any su
source. Make sure that it does not ove
load the receiver. Tune your receiv
zerobeat with this carrier using the *ban*
spread dial.
6. Turn the *bfo* pitch control until a be
note of approximately 750 cycles is hear
You may tune the *bfo* in either directi
from zero, but make a note of this ne
setting.
7. Using the *bandspread tuning dial,* tu
the frequency of the receiver back a
forth through zero beat with the carri
As you do so you should find that t
the beat note on one side of zero beat
stronger. Also you should find a narr
range of frequencies on the 'strong' si
that sound peaked. These should
around 750 cycles.
8. Move the *bandspread dial* to the we
side of zero beat to a tone of about 2
cycles. Now rotate the crystal phasi
control slowly to minimize or 'null' th
200 cycle note. it should almost disappea
9. Mark on the receiver or write down t
settings for the *bfo* pitch control a
phasing control. You now have arrived

the correct settings for these controls for reception of one sideband, either the upper or lower.

You may now determine which of the two sidebands you are set up for by either of two methods. Sideband stations on 20 meters normally use the upper sideband and on 75 meters they use the lower sideband; therefore you may determine which sideband you are set up for by listening on these two bands. You may also determine which sideband you are set up for by which side of zero beat is stronger. If the low frequency side (as read on the receiver dial) of zerobeat is stronger the receiver is set up for uppersideband. Sounds backwards doesn't it, but that is the way it works.

To set up the receiver for the other sideband go back to step six and turn the *bfo* pitch control an equal amount from true zero in the opposite direction. Then repeat steps six thru nine.

To get good sideband reception without tinniness you will have to turn the crystal filter to a position of intermediate selectivity. There is a compromise between good selectivity and good quality in the sound of the signal received. This point will have to be determined experimentally. With an average receiver a minimum of 15 to 20 *db* rejection of the unwanted sideband is easily obtainable without undue restriction of the audio bandpass received which results in tinniness.

If your receiver has a sharp *if* system but no crystal filter you may use the above procedure excepting step eight. If you have a Q-multiplier in addition to the sharp *if* system the Q-multiplier can be used in the null position to perform step eight.

If your receiver has a Q-multiplier only, set it in the broad peak condition and follow steps one to nine leaving out step eight. Some measure of sideband selectivity may be obtained.

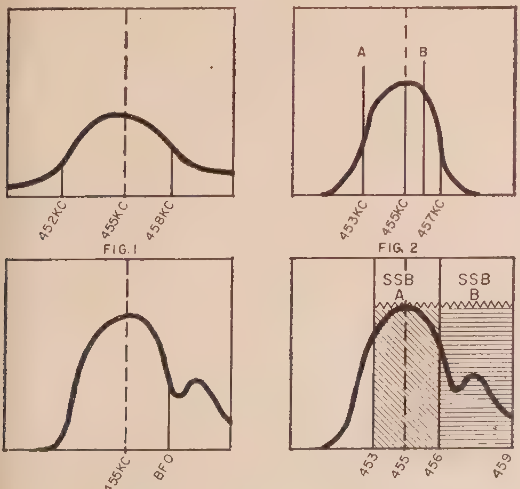


FIG. 1 FIG. 2 FIG. 3 FIG. 4

Figs. 1 to 4—Variations in if curve.

Two notes of warning. First, the *bfo* frequency cannot be varied without upsetting our carefully worked out alignment. Therefore, do not use the *bfo* as a vernier adjustment. Secondly, when you move the postion of the *bfo* in order to set up for the other sideband you are moving the carrier injection frequency, therefore you must retune the bandspread tuning dial in order to return the carrier insertion to its proper frequency. What this means is that when switching sidebands on the same frequency it is necessary to reset the *bfo* pitch control and phasing control to their predetermined settings and then retune the bandspread dial to bring the station on the other sideband back in. In this respect a slicer or sideband receiver with built in selectable sideband has an advantage, but what a price to pay for the advantage of having one control take the place of three.

What's Happening?

For a semi-technical explanation of what we are doing in the above procedure, let us first examine the normal *if* curve of a receiver in fig. 1. The bfo is placed at 455 *kc* and the pass band is seen to extend an equal amount in each direction. Remembering that the bfo is used to supply the carrier for the ssb station, we see that either an upper or lower sideband station may be received equally well. (Maybe at the same time). Now let us sharpen up the *if* bandwidth by use of the crystal filter and we see that although we have restricted somewhat the bandwidth received we will hear equally well, signals on either sideband. This is shown in fig. 2. Also in fig. 2 we can see that if we move the *bfo* to one side of center (position B) on the slope of the curve or about 1 *kc* from the center frequency of the *if* bandpass we see that on the left or low frequency side of the carrier insertion (*bfo*) frequency we have the hump of the curve and the signal is passed with little or no attenuation. This would correspond to the lower sideband being passed. On the right or higher frequency side the signal is down the slope of the curve and is considerably attenuated. We can further this attenuation as in fig. 3 by use of the phasing notch or anti-resonant frequency of the crystal filter. We place the phasing notch just on the high side of the bfo frequency by adjustment of the crystal phasing control which varies the frequency of the notch.

In fig. 4 we have two ssb stations, station A on the lower sideband and station B on the upper sideband, with their carrier frequencies, transmitted or not, being the same. Placing our *if* curve from fig. 3 over this situation so that the bfo is supplying the missing carriers we see that while we hear station A with little or no attenuation station B will be attenuated at least 20 *db*. This figure will vary somewhat receiver to receiver. ■

Lagoon from Malabar, Lord Howe Island, N.S.W.

C. Serle, VK3ARX/LH
105 Bambra Road
Caulfield, Victoria, Aust.

ONE MAN DXPEDITION

A casual remark to VK3CX, about three weeks vacation due in November, involved VK3ARX in more concentrated activity than had been experienced since being first licensed as 3RX in 1928. When I mentioned Lord Howe Island as a possible destination he said "You could go on the air from there and make a lot of dx stations happy—"I'll tee it up." "Oh no, not me," said I, "I've heard how hard these expeditions have to work. This is going to be a holiday on a coral island—my ears need a holiday as well!"

The next thing forthcoming was a letter on October 27, from Alan (who was on vacation in VK2) saying that the necessary rumors had been planted; VK2AIR who operated as VK2AYY/LH last July had agreed to lend me his equipment which was already there. A portable permit could be obtained from the R.I. who happens to be Jack DeCure, ex VK5KO, well known for DX work on 3.5 *mc*. All I needed to take was antenna wire.

I began to get an idea that someone somewhere was being high-pressured into something and maybe it was me. This lurking suspicion was strengthened by the receipt of the "DX Bulletin" from W4KVX, dated Nov. 4 giving operating schedules and frequencies for VK3-ARX/LH. As I had been inactive for 10 years, I had doubts that my operating was up to handling the dogpiles that would develop. I subsequently found that I need not have worried—it wasn't!—but I learned!

Somewhat dubiously I told VK3CX to set things rolling, dragged out a key and did 2 hours code practice.

The following day I had the finest set of sprained wrist muscles that ever graced a one-armed banjo player. While waiting for the arm to improve I managed to recover a bug that I had loaned to VK3CX twenty years before, and tried again. Result: a different set of sore muscles. Now I really was sore—I wasn't game to bring out a microphone!

In any event I reckoned that I could maybe persuade Trevor Donald, VK2FR to increase his activity if we got together on the idea. He has been on Lord Howe Island for ten years as weather man so I wrote to tell him what was being cooked up. He sent a warm invitation to visit him and promised to arrange some ham activity when off duty.

As I was due to set off on November 15 this would ensure that some signals would be forthcoming even if I myself did not get on. On arrival in Sydney the first blow fell, news came that VK2AIR had not left his receiver on the Island. The only way to get to Lord Howe is by the twice-weekly Flying Boat Service but the baggage allowance was only 35 pounds and I did not have a receiver with me. During the remaining two hours I dashed from shop to shop looking for copper wire to try out some antenna ideas on arrival. Finally I found four 50 foot coils of the right gauge.

Lord Howe Island is situated 420 miles NE of Sydney about half way to Norfolk Is. (Remember VK9AD). It is a crescent shaped coral island 7 miles long bounded at each end by volcanic peaks, the tallest being the nearly perpendicular Mount Gower, 2840 feet. The rich lowland area between the peaks is mostly about 1 mile in width. The 200 inhabitants occupy about 300 acres of this wooded portion. The southernmost coral reef in the world joins the two horns of the crescent to form a shallow lagoon. The flying boat landed in the lagoon watched by most of the inhabitants and all of the visitors. Within two hours word spread that a visitor was looking for VK2FR and he was finally located up a steep hill in the center of the island re-erecting a twenty metre dipole which had snapped from old age and metal fatigue. The transmitter was p.p. 807's, but to my sorrow the receiver was a BC-348M instead of the Super Pro previously sed. After the usual gabfest VK2FR very indly offered me the use of his station and ermission to rebuild anything unsuitable. How nany of your neighborhood hams would be repared to allow that?

Inspection of the site showed power lines n three sides of the house, high hiss level in he receiver and a power leak. Right now I hould mention that there are only three or four automobiles on the island, no telephones, o taxis, and transport is by ancient bicycle.

As I was living about 2 miles away from K2FR, this entailed a considerable pedalling.

The YLs may be interested to know that took 2 inches off the waistline and my weight ent down by eight pounds in two weeks, riding about 7 miles a day.

The first call from VK3ARX/LH on the vening of Nov. 19. brought 599 from FK8AS. No W stations were heard as conditions were oor and I was using the dipole. The following ay W4BPD was the first to score; next day ontact was made with W5BUK, W2TP, K3CX and W1AW. This didn't seem to line p with the popular idea of a Dxpedition, so bviously the signals were not reaching out. undry antennas up to 70 feet long were tried vithout much change in results. Meanwhile I sed a box of Bandaids on vine scratches and ractised falling off the bicycle gracefully, while exploring the island. Fortunately the war n the South Pacific did not involve Lord Howe s., although the ubiquitous Seabees left a plywood barge rotting on the lagoon beach. Only he carved letters "U.S. ARMY C.B. 37." indicate its origin.

Despite the distractions of the island scenery, hree full days were spent in making changes. The aid of VK2FR's fellow technicians at the WX station was enlisted to throw rocks carrying a light line over the tops of two 60 foot rees and 138 feet of antenna was put up, fed t the ¾ wave point, for 14 *mc* operation. This ounds easy until you try measuring the wire vith only a 12 inch rule and have to string the upporting line across two sets of power lines and three houses in tropical heat. The following ay the receiver was tackled. Only the strongest W stations were audible above the hiss. The bfo coupling was reduced, the first *rf* stage replaced by a 6J6 used as a cathode follower nto a grounded grid. A BC221 and *cro* was hen used to re-align all stages. By this time the iss was considerably lower but little could be one about the noise from nearby home power ools with sparking brushes.

A radio blackout for the first few days allowed only the strongest signals through. An ccasional European was heard but G2DC was he only *qso* with Europe during 10 days operation. As this was a vacation rather than a ull time Dxpedition, fishing trips, barbeques nd swimming took up some of the time. One unday morning not a single station was heard n either 7 or 14 *mc*, between 10am and noon.

The "CQ" W/W DX contest was another thing—either the BC348 just could not separate them well enough to read the calls of the stations replying, or due to inadequate advance publicity, the DX said "just another VK3" and went looking for rare ones. A number of stations asked "where is L.H." Whatever the reason, over twelve hours operation yielded only about one log page full. Of course VK2FR was around from time to time to work a new one under his own call.

On the first afternoon of the contest he arrived home from the weather station after a ten hour shift which had started at 2 am and was sleeping when one W asked me "where was VK2FR." When told, he said—"what—asleep with the whole world waiting to work him?"

Congratulations are due to the W/K stations who respected the occasional CQ VK/ZL by holding off until the "locals" had been cleared. The next CQ would bring a dozen replies. Only one W busted up a QSO. He got told about it at length before I relented and gave him a signal report. Maybe I should not have replied but no one else was calling and I thought the lecture would stop him repeating his tactics with others. Apart from the contest period it was found that after working a dozen stations on one frequency I could call CQ several times without getting a reply unless I shifted elsewhere in the band. Do these new crystal controlled receivers and converters only work on one frequency like transmitters?

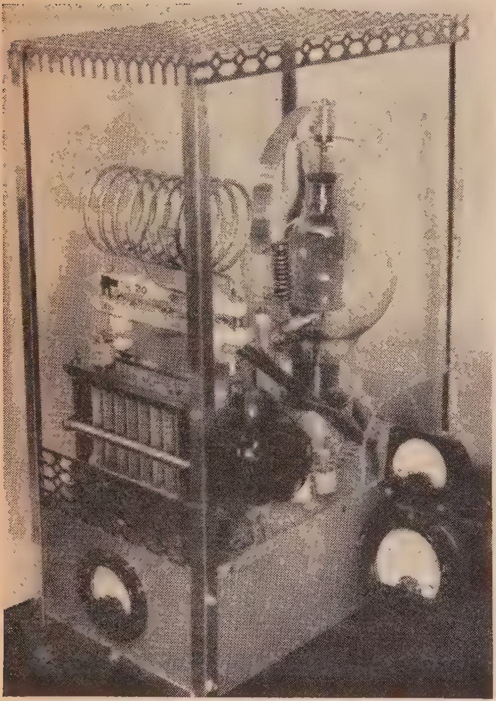
Incidentally we got a true report from a SWL later who said "I couldn't notice any difference between signal strengths of VK2FR and VK3ARX/LH" which of course was not surprising as we were using the same transmitter and antenna for both stations. The superiority of the new antenna, four half waves, compared with the dipole was apparent to VK4YP who said he had not been able to hear us before although we were only 400 miles apart. The additional height allowed the signal to clear an intervening hill.

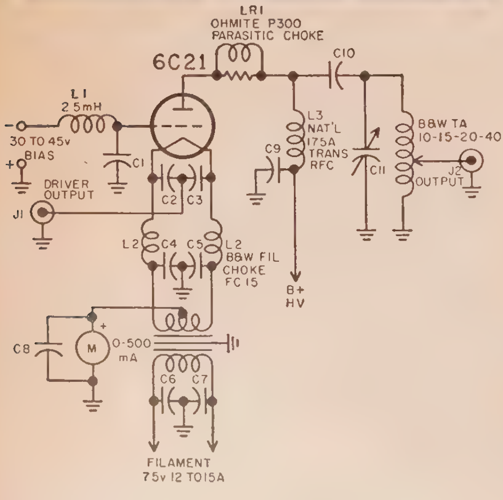
Approximately 200 stations were worked in the ten days VK3ARX/LH was on which seemed a poor total for the effort involved. Further activity has been promised from another VK3 in the near future followed by VK2AYY/LH once more in February 1959. Meanwhile VK2FR has been sparked into activity and threatens to go on with a DSB-100, if the Collector of Customs can unharden his heart. If nothing should come of it, Trevor says the am modulator still works, and he still knows the code.

VK3ARX is back in Melbourne and has quite a collection of I.R. coupons but no dollar bills! If only I had remembered to ask for a dollar per QSL I could have paid for the trip, and maybe even rebuilt at home. Does anyone know the exchange rate on VK3 cards from their home QTH? ■

Mace Warner, WØJRQ
165 Dudley St.
Lakewood, Colo.

THE $100.00 KW FINAL





C1 thru C8—.01-600 volt ceramic wafer.
C9—C10—.001 5 kv, Centralab #858S
C11—Cardwell Transmitter Type 50-100 mmf.

Later commnuication with Mace indicated that improved results were obtained when a parasitic suppressor, identical to LR1, was inserted between the junction of L1—C1 and the control grid of the 6C21.

A bunch of the boys were whooping it up in the bargain basement of the local ham emporium, one PM a month or so ago, when WØSOB (you don't believe it? Look in your call book), tripped over a monstrous box and came up with some remark about this must be an old Indian burial ground, brushed off the dust and read the faded lettering "6C21" made by Machlett, 1944.

After ripping open the crate, he discovered what appeared to be a good start toward a super power Voice of America station. After searching through numerous spec books the possibilities, according to Eimac's figures, of using this bottle for a grounded-grid linear final were unlimited and he proceeded to lash up in the most typical haywire fashion, a KW on the tail end of a KWMs 1 that has been the talk of the SSB fraternity since.

About this time, WØJRQ bought an HT32 and with his XYL out of town decided to see how much sleep he could lose and still operate the vox. He built the described final with the technical assistance of WØAJL, in two nights.

It was purposely agreed that, with the exception of the 6C21, which was surplus, that all new standard components would be used. The total cost is slightly under $100.00 and the results are amazing.

Power Supply

The power supply is conventional. In this case 2600 volts at 300 mils is ample on SSB. Input on DSB and CW about 600 watts with the plate of the 6C21 hardly showing color. No forced air cooling is necessary, however, ample ventilation should be provided for circulation around the tube.

The reports and results from this final have been wonderful. The tube, an old radar pulse modulator, is running so far under its ratings and capabilities, that we will be in business with it for a long, long time.

Just use good layout principles, use copper strap for *rf* leads, use an *rf* meter for maximum output tuning and drive it direct with the HT-32, KWM-1, or similar driver.

We'll be listening for another SOB signal on the air.

Putting The ARC5 On Two-Meter SB

Dick Ray, W5SNX/2
c/o Transcontrol Corp.
2 Yennicock Ave.
Port Washington, N. Y.

Under the auspices of the Central Technical Net of Air Force Mars whose NCS is AF5LHX he author worked out a conversion of the T23 ARC-5 for two-meter sideband.

The two 1625's are replaced with two RK34's o gain an extra stage and to reduce the curent drawn from the power supply.

One half of the first RK34 (see fig. 1) is a 2.5 *mc* xtal controlled oscillator. This tube s installed in the original oscillator socket. The uned circuit for this oscillator is mounted just n front of the oscillator socket. The 25 mmf APC capacitor is fastened to the side of the hassis. The coil is suspended between the tator of this capacitor and a tie point.

The second half of this tube is a doubler o 65 *mc*. The channel D oscillator coil is rewound to resonate at 65 *mc* with the output capacity of the tube.

The second RK34 is installed in the original 625 multiplier socket. Only one half of this ube is used. It functions as a doubler to 130 *nc*. The channel D plate coil is rewound to esonate at 130 *mc* with the output capacity of the tube.

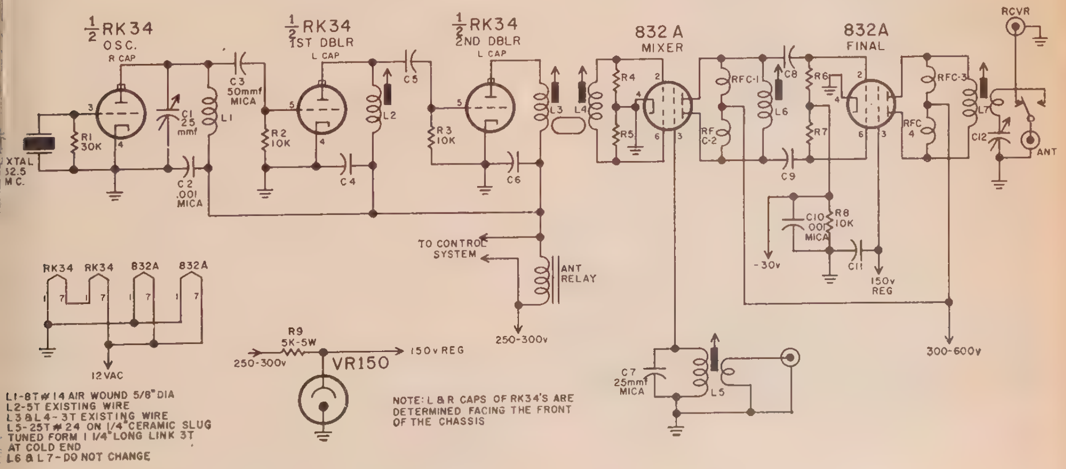
The 832A that was used as a multiplier is now used as a mixer. The channel D grid coil which is on the same form as the second RK34 plate coil is rewound to resonate at 130 *mc* with the input capacity of the mixer. The screen of the mixer has no *dc* voltage applied o it. A 14 *mc* tuned circuit is connected between the screen and the chassis. The coil form for this tuned circuit is mounted inside of the box that holds the 832A tube socket. It is mounted horizontally below the tube. The screen bypass must be removed from the socket. The lead from the cathode to the plug in the bottom of the box is removed and the cathode is grounded to the box with the shortest possible lead. The pin thus released is used to bring the inner conductor of a piece of coax to the link on the screen tank. The other end of this coax goes to a chassis fitting mounted on the side of the chassis. The plate circuit of the mixer is left intact as it is in the original unit.

The channel D coils for the mixer plate, the final grid, and the final plate are used without any modification.

A few changes must be made to convert the 832A final from class C to linear operation. These consist of changing the grid resistor to 10K, applying –30 volts of bias, and operating the screen at 150 volts regulated. The VR150 that regulates the final screen voltage is mounted in front of the oscillator socket. Some ARC5's already have a hole here with a plug in it. The dropping resistor for the VR is mounted under the chassis.

The antenna relay is retained and is operated by putting it in series with the B plus feeding the RK34's. To allow this relay to be de-energized while receiving its coil is shunted by the control system.

[*Continued on page 113*]



SMALL TALK ON THE LANDLINE

W. A. Greene, W8CFW
1084 Sells Ave. W.
Columbus 12, Ohio

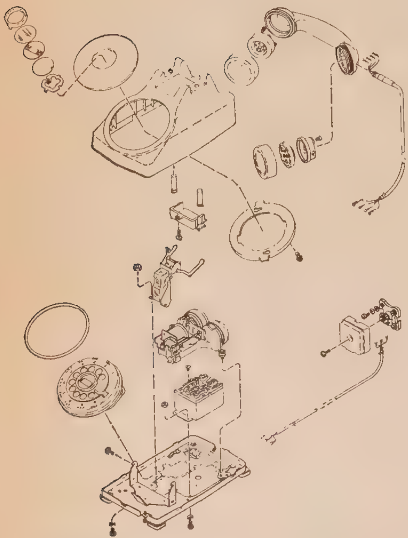


Fig. 1—An exploded view of a modern telephone.

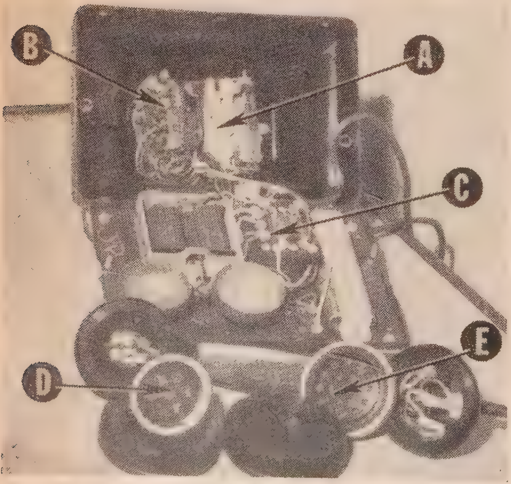


Fig. 2—'Inside" view identifying, A-Hookswitch, Dial switch, C-Induction Coil, D-Earphone, E-Microphone.

Although the truth may come as a shock t some of you OM's, it must be told: that telephone in your shack has uses other than phon patching! As a matter of fact it is a very common item occuping a prominent place in millions of households. In all fairness, however it should be pointed out that the interest o the average ham (whatever that means) probably doesn't cease with picking up the handset to stop the infernal ringing. There is alway that curiosity as to what goes on inside th "black box" and it will be the purpose of thi article to satisfy some of that curiosity.

Modern telephones, considered as a unit are complicated both from the mechanical sid (as illustrated in the exploded view of fig. 1) and the electrical side. The latter, however, becomes rather simple when one considers only those circuit elements that are in use at an given instant. While there are many styles o phones currently used, the basic principles are the same, so a typical unit, that seen in fig. 2 will be described. For identification purposes notice the "hookswitch," upper center; the "dia switch," to the left of the hookswitch; the induction coil, middle center; the earphone (lowe left) and the microphone. (The T-1 mike button, incidentally is an FB ham item. See *CQ* September 1958, "Modernizing the T-17 Microphone," p. 35.)

An easy way to understand any piece of equipment is to check the circuit diagram before further confusion sets in. A quick glance at the complete schematic of fig. 3 will indicate that the wiring itself is not so complicated, but that tracing it out on the phone is difficult because of the switching arrangement that sets up the different operational conditions. Notice that the Y and B leads are not used and that the ringer with its series capacitor is directly across the line (R and G); this is a typical private hook-up. Many other arrangements are possible, as in one type of two party line which utilizes the ground. In this case the ringing voltage is between Ground and R or G, with the ringer connected appropriately, depending on which party you happen to be. Talking and dialing connections will still be across R and G.

Now for the simplifications in which only those parts of the circuit actually in use for a particular condition will be shown. When the phone is in the "hung-up" condition it consists, for all practical purposes, of a ringer circuit and nothing else. In fig. 4a the heavy lines show this fact. Verification may be had by tracing the other wiring; you will notice that everything else is disconnected. An equivalent circuit for the hung-up condition is given in fig. 4b. Thus when a ringing voltage is impressed on the line, generally on the order of 65 volts *ac*, the phone acts as a load consisting of a capacitor and a ringer coil in series. More variation of connections is found regarding ringers than in any other part of the circuit. There is an open circuit voltage of 48 *dc* on the line, but the capacitor, of course, prevents completion of the *dc* loop.

As soon as the handpiece is lifted the circuit assumes what shall be called the "talk-listen" condition for which the schematic is given in fig. 6a. This is the most complicated phase of operation and may best be appreciated by considering the equivalent circuit of fig 6b. The whole idea of this phase is to couple the earphone and microphone to the line in such a manner that simultaneous transmission and reception may occur. You may wonder where the ringer circuit went as this is not removed by any switching. From an electrical standpoint it does not exist at normal voice frequencies. The ringing frequencies are low (between 20 and 66 cycles) compared to frequencies present in conversation, thus at these audio frequencies the RLC ringer presents a very high impedance across the line which can be ignored in the talk-listen condition.

Network Z_1, consisting of C_2 (about 2.0 mf) and an induction coil, is the heart of the system. The particular coil illustrated, one of the more popular of several types used, is a *Western Electric 101A* anti-side tone coil. Besides permitting coupling to the line the anti-side tone feature is probably the most important aspect of network Z_1. Without this, coupling between the earphone and the mike would be great enough to interfere with conversation. This network reduces the side tone so that a person hears his own voice at a normal level. He, therefore, does not tend to talk softer which would make reception difficult. The arrangement of the coil windings is such that the current through them creates opposing fields under talk conditions which reduces greatly the voltage induced in the earphone. The most modern phones use a Varister in this circuit for improved performance.

Under talk conditions the telephone is effectively a series device in the line, the line current varying according to the impressed voltages. The *dc* resistance of the mike varies over a range of approximately 50-200 ohms which swings the voltage across the phone input terminals (R and G) in a 2.5 to 5.0 *vdc* range. A further circuit simplification is sug-

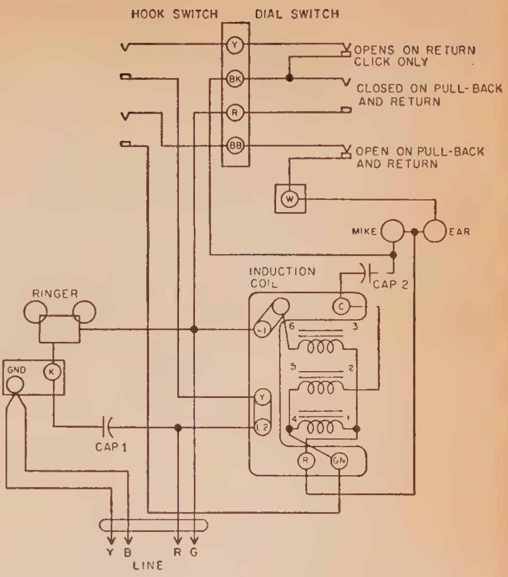


Fig. 3—Complete schematic of the telephone unit.

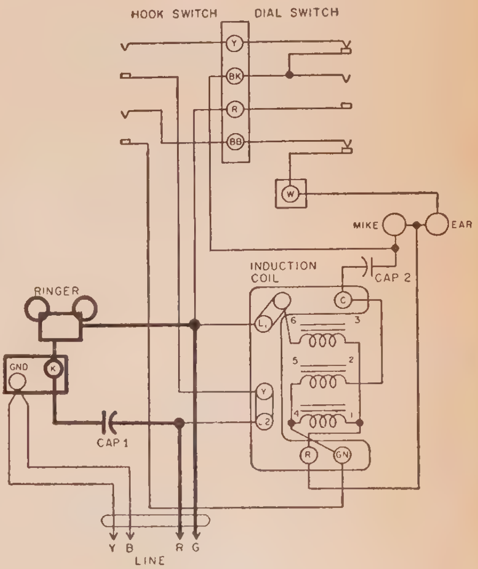


Fig. 4A—The portion of the phone in the circuit when in the "hung up" position. Note that only the ringer is in the circuit.

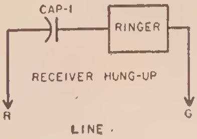


Fig. 4B—An equivalent circuit for the hung-up condition.

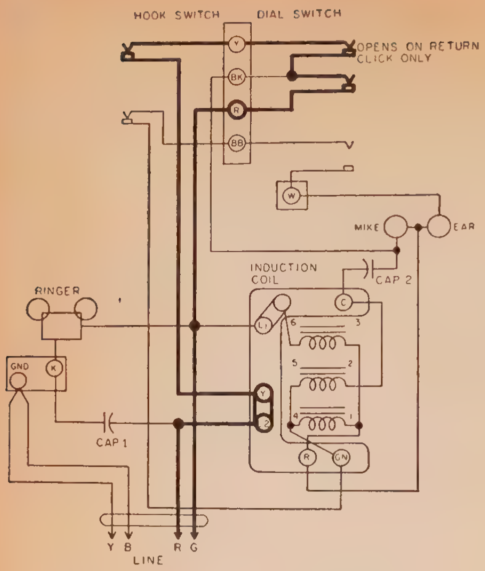


Fig. 5A—Heavy lines indicate portion of the circuit actually in use when the dial is pulled back (with receiver off hook). When dial is released e switch between terminals Y and BK opens at each click.

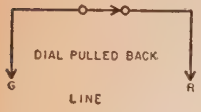


Fig. 5B—Short established across line when dial is pulled back.

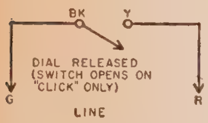


Fig. 5C—Equivalent circuit when dial is released. Each click opens circuit.

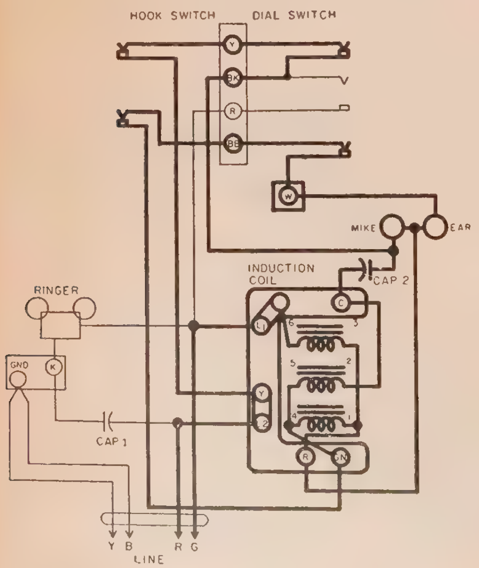


Fig. 6A—Heavy lines indicate the portion of the circuit in use under talk listen conditions.

gested in fig 6c where the Z_1 network, the earphone and the mike are lumped together and called Z_2. The whole talk-listen arrangement may then be reduced to fig. 7 which illustrates a condition occurring for three different purposes.

Before you pull back the dial the equivalent circuit is as just mentioned. As soon as the dial is rotated from its rest position the circuit looks like fig. 5a and if you trace this through you arrive at the equivalent circuit of fig. 5b which is nothing more or less than one great big short. Heretofore the phone put a series resistance in the line, due to the mike of about 60 ohms resistance; now even this is shorted out, indicating to the central office equipment that dialing is about to begin. (If you are not on the dial system, merely picking up the phone gives this short condition which signals the operator that you wish to make a call.)

When the dial is released a new condition occurs each time the dial passes a number or "clicks." This clicking is accompanied by a switching action which breaks the short established by pulling back the dial (fig. 5b) and causes the circuit to look like fig. 5c. It's just an open. The phone isn't even there; you could do the same thing by taking a pair of dikes to the line! This open is very brief and as soon as the dial stops the circuit returns to the condition shown in fig. 7 and remains there until you dial the next number at which time the sequence repeats. After sufficient numbers have been dialed the central office equipment automatically connects you to the distant phone or busy-signal equipment; your own phone has no control over this operation.

From a mechanical standpoint the dial itself is worth mentioning as its operation is also critical from an electrical standpoint. Examination of the reverse side of the dial will show a spring loaded flywheel (visible in fig. 2 as a small round device with two vertical slots). The spring is wound when the dial is pulled back and thus supplies the energy for returning the dial to the rest position. A small mechanically coupled cam provides the switching action required to open the line on the clicks. The important point is that the dial must return very close to a predetermined speed as proper timing of the dialing pulses is necessary for good operation of the central office equipment.

Now that the various phases of operation have been explained individually the entire sequence may be tied together by tracing a complete cycle of *dc* line current conditions from the hung-up to call-completed stage. An idealized graph of the line current is presented in fig. 8. Maximum current is obtained when the line is shorted as this is a series device; for the same reason zero current exists on the line when there is an open circuit. The minimum current is that caused by the series resistance when the phone is in the stage indicated

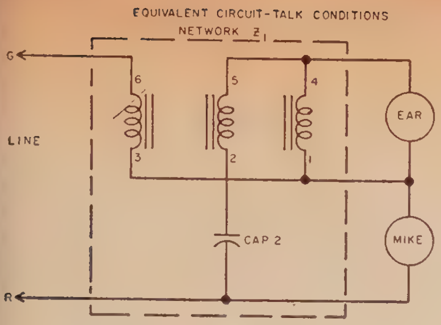


Fig. 6B—Equivalent circuit—"Talk Listen" condition.

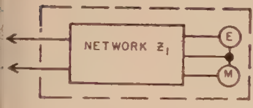


Fig. 6C—Network Z (enclosed by dotted lines) is a simplification of fig. 6B.

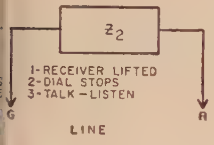


Fig. 7—Equivalent circuit when the receiver is lifted and the dial is at rest.

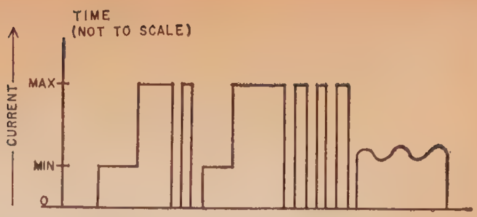


Fig. 8—Telephone line current while dialing "24." (Idealized)

fig. 7, i.e., talk, etc.

When the handset is hung-up the line is pen *dc*-wise so there is zero current. (See fig. 4b.) As soon as the handset is lifted (fig. 7) the minimum current condition occurs and continues until the dial is pulled back, shorting the line (fig. 5b) causing the current to rise sharply. The graph illustrates dialing phone number 24, therefore the current remains at a maximum while the dial moves from the 2 position to the finger stop. Upon release there is a click (fig. 5c) and the current drops to zero for the instant that the line is open. The line closes and the current rises to maximum until the second click when it again drops sharply, rising to the minimum value as the dial stops. You are now ready to dial the 4 which is also illustrated. Sufficient dialing pulse information has now been transmitted to allow the central office equipment to make a connection. After this the current varies depending upon the ringing or talking on the line. About this point the XYL gives you a QRRR

[*Continued on page 110*]

IVT on 50 MC

Jack Gould, K5KRE
1765 Carter Avenue
Baton Rouge, La.

As is probably true in most other Channel 2 ties, Baton Rouge, La., has not only its share Tennessee Valley Indians, but, on six meters, ore than its share of Indian Tennessee Valyans.

Even crosstown talk on 50.25 *mc* by the apital Area Emergency net, for instance, has ften been QRMed by "They went thattaway, odnuh," especially with beams aimed at BRZ's 1000-foot tower.

But, with such stuff pouring out on 55.25 c at an ERP of some 30 very full gallons, hat could we expect? And what, if anything, ould be done about it?

At a ham club lecture one night, Bill Owen, 5WG, professor in EE at Louisiana State niversity, had mentioned that an open quarr-wave section would act like a sharp-tuning ut definite short circuit.

So, let's see: WBRZ audio was 55.25 *mc*. ivide that into 2770 and you get almost exctly 50 inches for a quarter-wave. But whoa— ow about the velocity factor?

Well, for the chunk of RG59U lying around, at turned out to be 0.66. That times 50 is 3. So we clipped a piece exactly 33 inches ng, trimmed the insulation and soldered it a coax plug.

Mounting a T-connector atop the elderly Gonset Communicator, we plugged in the beam and tuned to what turned out to be a cooking program on TV, strong enough to half-close the tuning eye.

Holding our breath, we plugged in the stub —and it worked! The announcer's voice dropped several *db*. We tried clipping a quarter-inch off the far end of the stub, then another, and at 32½ inches the IVT was down to R ½.

But what, if anything, did the "short" do to the 50 *mc* band? A quick check showed no appreciable effect on incoming signals. But what about outgoing?

A flip of the TR switch showed the tuning eye far off the nearly-closed position it had been adjusted to for the beam alone. Attempts to adjust "load" and "tune" again to that nearly-closed position brought a surprise and some apprehension: The eye not only closed—it overlapped!

Something, obviously, was wrong.

Just for the heck of it, we flipped the switch, gave a short CQ and watched the overlap wiggle with modulation. And just as a matter of habit, we listened:

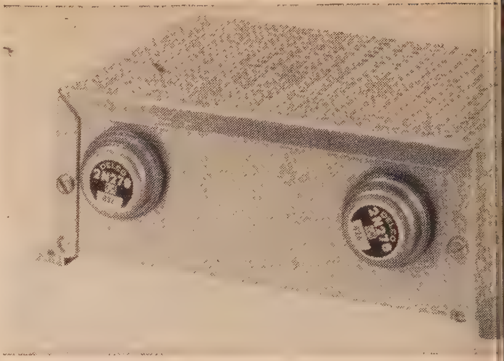
"K5KRE, K5KRE," we heard, "this is K0REE, in Topeka, Kansas, reading you loud and clear. The handle here is Irene. What say, old man?" ■

CQ Reviews:

The Transcon* Transistor Power Supplies

When we are contemplating mobile operation, one of the more serious problems confronting us is that of supplying power for the equipment. The classical solution is, of course, apparent. Merely install a Vibropack to supply the low voltage required for the receiver or converter and then include a dynamotor to provide a voltage source for the transmitter. Unfortunately, it doesn't end here. With a conventional system such as described, there exists a pitfall or two; the most likely being finding yourself stranded on some lonely road in the wee hours with a dead battery. One way to prevent such a misfortune is to install a Leece-Neville alternator to replace the standard car generator. This will provide a substantial charge even while the engine is idling. Excellent as the solution may be, it is a rather costly insurance plan, the premium being in the order of $100.00 for a used 12 volt model, not to mention the added difficulty of installation.

With the advent of the transistorized power supply, all this has been eliminated. Not only is a transistorized unit smaller, quieter and far more efficient, it is also considerably less demanding on the battery. The actual efficiency figures are startling. There is no fabulous surge drawn by the transistorized supply and it operates at continuous duty at about one half the battery drain of an equivalent dynamotor. When a dynamotor fails, there is a strong possibility of a short circuit resulting in severe battery damage. The dynamotor is often impossible to repair. About the only failure a transistorized supply can suffer is the loss of a power transistor which is easily replaced at a nominal cost. When this does occur, the supply draws no current and delivers no output. An additional factor of interest is that in the event of a short circuit in the transmitter, i.e. should the voltage output
the supply become shorted, the transistors w
stop oscillating and no output will be delivere
Safety factor: 100 per cent.



MODEL NO.	H250	H311	H325	H375	H600
OUTPUT WITH NO CENTER TAP CONN.	250 VDC @ 65 MA.	300 VDC @ 100 MA.	325 VDC @ 150 MA.	375 VDC @ 200 MA.	600 VDC 200 MA.
SIMULTANEOUS OUTPUT WITH C.T.					
COMMON TO PLUS	250 VDC @ 37.5 MA.	300 VDC @ 50 MA.	325 VDC @ 75 MA.	375 VDC @ 100 MA.	600 VDC 100 MA.
COMMON TO C.T.	125 VDC @ 65 MA.	150 VDC @ 100 MA.	162.5 VDC @ 150 MA	187.5 VDC @ 200 MA.	300 VDC 200 MA.

Fig. 2—Output voltage and current capabilities.

The gang at Transcon had all these facto
in mind at the onset, and they have develope
a complete line of transistorized mobile pow
supplies for the amateur market which f
just about any normal requirements. These a
extremely compact, well engineered uni
which will operate on either 6 or 12 volts d
Units are available with 24v inputs on speci
order. Figure one shows a typical schemat
for a Transcon supply. All the units in th
line fit this schematic with only values
components differing between units. Figu
two is a chart which shows the various stoc
models available. Note the flexibility in th
output circuit. Either full or half voltage ca
be obtained merely by selecting the prope
output terminals.

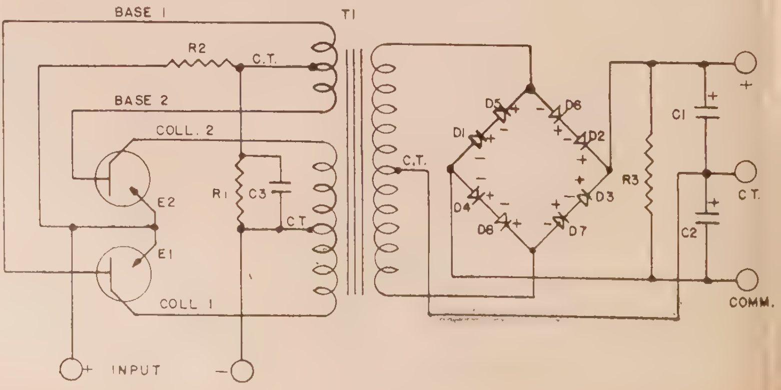


Fig. 1—Schematic for the Transcon power supplies. The various models vary in component value only.

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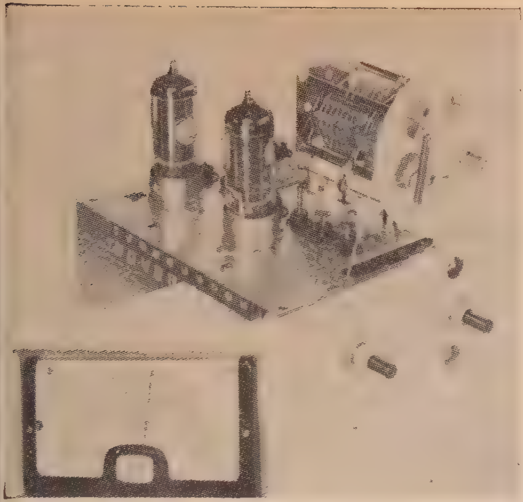
* Creative Electronics—94 Lincoln Ave., Stamford, Conn.

CQ Reviews:

The Geloso VFO



Among the many exotic electronic treasures found in the home cellar division of the CQ Lab (QTH of W2NSD), was the Geloso N.4/104 *vfo*. This little package looked sufficiently interesting for me to over rule my staunch belief in the old axiom "Never Volunteer," and after twisting Wayne's arm through 180 degrees, he consented to let me take it home and put it through it's paces.

The Geloso Company of Milano, Italy is extremely popular in the European area as a manufacturer of high quality electronics equipment for the amateur. As of late, they have been producing quite a bit of their equipment for export; such is the N.4/104 *vfo*.

Upon opening the package, I was immediately impressed by the construction of the Geloso. The mechanical layout and wiring are about as high quality as I've seen to date in any amateur gear. Along with the *vfo* proper, they also supply a beautiful dial, plastic bezel and pointer assembly plus all necessary hardware for mounting the unit in a transmitter of one's own design and construction. This handsome dial is the same as is found on the Geloso receiver and transmitter also currently available in the USA.

Technically, the circuit of the N.4/104 VFO presents nothing radically new in design. It does, however, embody obviously superior application of the currently popular Clapp Oscillator Circuit. The unit begins with a 6CL6 Oscillator tube employing switchable LC networks designed for high stability. This in turn feeds a single 5763 which operates either as a straight amplifier or a frequency multiplier, depending on the band of operation. The unit uses low loss slug-tuned coil forms throughout, and has a 10:1 reduction tuning system built in. One interesting feature of this unit is that it has *rf* output on all amateur bands, 10 through 80 meters which is quite adequate to drive an 807 or 6146. All control and power leads are brought to a 10 terminal strip on the left underside corner of the chassis. There is provision for cathode keying and external voltage regulation as well. Power requirements are 6.3 volts *ac* at 1.4 amps, and 275 to 350 volts dc at 60 *ma*. A single external OA2 or VR-150 provides the voltage regulation.

Perhaps the most significant feature of the N.4/104 *vfo* is the amazing stability that the unit possesses. I was able to zero it in the home station receiver and give the table several healthy swats with my fist without altering the frequency more than a few cycles; this being done with the unit just sitting on the table less any type of cabinet or mounting to give rigid mechanical support. Checking on all bands showed the note to be clean and the bandspread quite adequate. All in all, I'd say that the Geloso *vfo* is the most outstanding dollar for dollar value that I have had the privilege of testing to date.

Barry A. Briskman, K2IEG

SCRATCHI [*from page 24*]

better reserving me cupple pages of ads, instead of one!

Before you rushing to sending me for-bits to getting yours, Hon. Ed., holding on to your Hon. Hat. Scratchi's Conelrad Monitor are doing something no other monitor can doing. Yes indeedy. With the S.C.M. you will never having to go off the air for Conelrad test.

Whenever you being on air, monitor are reeding safe. So the S.C.M. are also F.C.C. (Foolpruf Continyous Conelrad). Scratchi can making dubble-your-money-back-absolutely garantee on S.C.M.

You thinking I talking thru hat? Not at all. Here are what Scratchi going to sell for for-bits PP. You getting one neon bulb, one socket, to feets twisted pair wire, ate feets single wire.

To using, you hooking wire to socket, and connecking wires across speeker of BC set. Taking single wire and wrapping one end around antenna coil on BC set and other end leeving loose in vicinity of final tank coil.

May not needing ate feets of wire and maybe not needing to connect it to anything. It just making surely amchoor having BCI.

How it working are reel easy. When amchoor not on air, and with BC set tuned to local stay-

[*Continued on page 90*]

sideband sideband sideband

SIDEBAND

By: **Bob Adams, W3SW**
P. O. Box 625
Silver Spring Md.

WORKED 100 COUNTRIES
Two-way SSB
(in order of award)

W6UOU
W2JXH
F7AF
K6GMA
W3SW
W4IYC
TI2HP
W8QNF
W6ITH
VE3MR
W8GCN
W8EAP
W8YBZ
W0QVZ
W0FUH
W8PQQ
ZL3PJ
K2MGE
W2OQO
W2VZV
W6IAL
K2JFV
W1ADM
TI2RC
W2CFT
K0ABH
ZL3IA
W6BAF
W2TP
W6RKP
PY2JU
W6UPP
W6PXH
W0CVU
W4INL
W8YIN
TG9AD
W3NKM
W6QFE
W8MG
PY4TK
K9EAB
W7IAA
VQ4ERR
W8MPW
W3MAC
W1GR
W8JXM
W1EQ
W5FDZ
W8JXY
W2OTZ

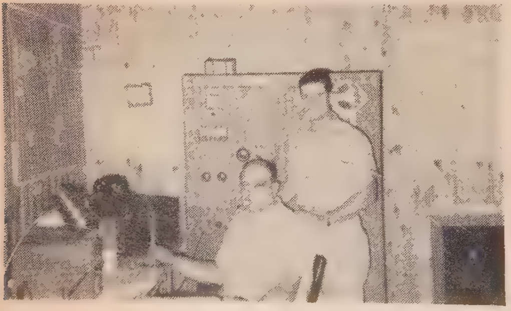
At exactly 1800 GMT on April 18th, 'bedlam' broke loose on all of the popular spots for sideband operation. A few moments before the magic hour the bands were so quiet you would think we were having blackouts from sun spot activity. A minute after 1800 GMT it was impossible to find a clear spot. In ten, fifteen and twenty meters, CQ's Third Annual SSB World Wide Contest had started. Fifteen was the most popular band for the US sidebanders because they could call on the DX station's frequency. The new transceivers really showed to advantage in this contest and resulted in many higher scores because it was not necessary to zero the transmitter to the receive frequency. If we obtain the addition fifty *kc* at the top of twenty, as is indicated, next year's contest will see some amazing scores, with the increasing numbers of transceivers becoming available.

The rules of this Contest permitted W/K stations to work other W/K stations which contributed considerably to its success. In other years American amateurs quickly worked most of the DX stations which participated, and therefore interest waned early. Not so this year! It is believed that the new scoring method will result in a much fairer competition to all countries than the earlier Contests. While conditions were not the best, reports from all corners of the earth, indicate excellent results. Fifteen meters stayed open nearly the entire period, and was probably the most active band.

HB9IE who operated the entire twenty-four period seems to have made the most contacts with an unofficial 616. No information is now available at this time on Pete's prefix multiplier. He went right to bed after the final contact for some much needed sleep.

I contacted Ami, 4X4DK at 1802 GMT at the close of the Contest and was informed that he had 461 QSO's and without any time out for rest. In spite of his apparent weariness, Ami reported a wonderful time and is already looking ahead to next year's shindig.

Robbie, VQ4ERR was heard throughout the entire period giving out numbers like mad. He is getting some practice for his next dx/pedition to Seychelles in August when he will sign VQ1ERR. I am happy to have been instru-



Bob, W0HXX seated, Harry, W5HFQ standing.

At SSB dinner; l to r—W8BP, K1JTB/VO1, K2TEX, K8IGG, K2MGE, K8JTB, W2ZG.

ntal in obtaining, with CQ's help, a portable wer-plant for Robbie so that he can operate ntinuously without depending on the hotel's nerator which operates only four hours a day.

SP3PL in Poland, a newcomer to sideband, s very active and made many contacts. orge, UA1DZ was another station from be- nd the "iron curtain" to participate in the ntest.

SV0WB had an unusually strong signal on enty meters all through the night and by me very expert operating, was able to run a high total. By constantly indicating the ex- t frequency he would listen on, prevented ch useless calling, and this procedure was ed successfully by many smart DX stations cluding, 4X4DK, ON4DM, VK3AAE, L3DX, VQ3DX, VK3AHR, DL41VR, 39IE, EA7JH, VQ4ERR, DJ1BZ, HB9TL, Z1AB, GW5TJ, GC3LXK, VE8NH, PA0RE d VK6RU etc.

VU2RX reported to your Editor that he was joying the Contest very much. VS4JT, Z2SY, KB6BL, KL7CDF, BV1US and C4USB were all active and helped considerly to make things interesting.

Humberto, TI2HP and Martin, VE3MR arnged their dx/pedition to TI9SB so as to be ive during the Contest. Although they enuntered heartbreaking experiences with wer-plant failures etc, they made over 200 ntest contacts. QSL's will be sent to all tions who contacted them.

HC1ET operated all of the twenty-four hours d made over 400 QSO's. He will send QSL's soon as the cards have been obtained from printers.

Among the high scorers in this country are 2SKE (as usual), W6VSS/6, K4SUK, LAS, W4MS, W4BJ, W0FUH, W3ADT, NCG, K6MMW, W4GOG, W6DON, GIE, K3GNQ, K5PJF, W9EWC, and LZO. (From the way he was going K5LZO l not be last.)

W3SW made 283 contacts in 49 countries, t has grown too old to stay up all night, even in a sideband contest. I found the transceiver a wonderful way to make fast contacts and QSYs in the band.

Some other DX stations who were active in this Third World Wide CQ SSB Contest were ZS5JY, TG9PF, YS1CD, YS10, DJ1BZ, XE1ZM, KZ5WZ, EA2CA, DL4ML, DL4WX, DL4YB, G2CWL, DL7BA, G2SUC, G3AWD, PA0IE, OA4GM, SV0WE, YN1BS, VE5PU, SM5AQV, VK6TH, DJ0BT.

Ted, W6UOU was represented by his "secret weapon", W6WNE, his XYL Meredith. Many XYLs were heard calling "CQ-Contest".

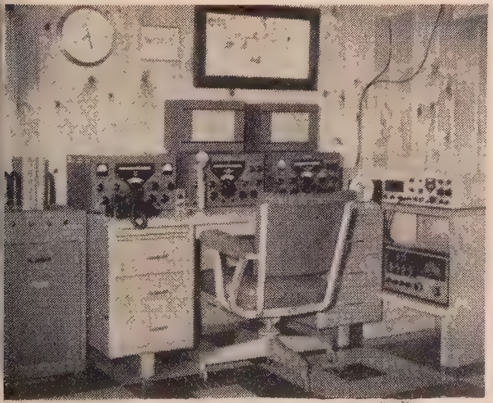
ZL3DX, Wynn who is planning an expedition soon to VR5, Tonga Group; ZM6, British Samoa and ZK2, Niue, when last contacted was over 300 contacts. VK3AAE gave me number 59346 at 1300 GMT, with six hours still to operate.

The ten meter segment of the sideband fraternity lost one of its staunch pioneers when Dave, ZL3AR joined the ranks of the Silent Keys. His cheery personality and ready wit was something to look forward to when the Zed Els were coming thru. Monty, W6MMB who sent us this information believes ZL3AR has gone ahead to prepare the new QTH's we all have to move to someday.

Dave, W9KON sends us a tip for those who may be experiencing arcing in their 6AG7 tubes when running high voltage on the plates in a grounded-grid linear. Dave found that the 6AG7 has an internal shield which is connected to pin ♯1, and that the arcing occurred between the plate lead and the shield. He cured the trouble by not grounding this shield with the grids, and letting it float. Now Dave runs 1000 volts on his 6AG7's.

We should have some scores in the next column, but the official standings will not be known until the September issue. in the meantime I am looking forward to some long hours of checking all the logs anticipated.

73, Bob, W3SW



W0IIC

Dorothy, K2MGE with Bob, W3SW at SSB dinner.

YL

by Louisa B. Sando, W5RZJ

212 Sombrio Drive, Santa Fe, N.M.

Results 10th YL-OM Contest

Congratulations to these top scorers in YLRL's 10th Annual YL-OM Contest held Feb. 28-Mar. 1 (phone) and Mar. 14-15 (cw):

YL PHONE	Contacts	Sections	Score
1st—W5DRI, Dena Morgan	801	70	70,088*
2nd—K5BNQ, Doris Anderson	660	64	52,800*
3rd—W5ERH, Betty Sutton	568	67	47,570*
OM PHONE			
1st—K9ALP, Lester Arndt	125	45	7,031*
2nd—K6SXA, Lowell Fink	103	43	5,536*
3rd—W8AJW, Jack Siringer	108	37	4,995*
YL CW			
1st—W2MWY, Ann Weinstock	411	74	38,018*
2nd—KL7ALZ, Geraldine Nichols	464	81	37,584
3rd—W1RLQ, Grace Swenson	389	72	35,010*
OM CW			
1st—K6SXA, Lowell Fink	67	35	2,931*
2nd—K9ALP, Lester Arndt	59	29	2,138*
3rd—W5DQK, Shelton Morgan	58	29	2,103*

(*Low power multiplier)

This is the second win for Dena, W5DRI, in the phone section. Dena placed first last year also, and second in '57. For photo and write-up, see p. 90, CQ June 1958. Doris, K5BNQ, who made second high YL phone score, placed third last year and second in '57. For photo and write-up see p. 91, CQ June '58. Betty, W5ERH, with third high YL phone score, has placed in the top three for the first time. Betty is active in GAYLARK and TYLRUN, has YLCC and WAS.

In the cw section, top YL scorer, W2MWY, Ann, has long been a cw operator, though she spends time on phone as well. She became a member of YLRL the first year it was founded. KL7ALZ, Geri, licensed since 1951, is a past president of PARKA, and holds DXCC, WAS/YL, WAS & WAC. W1RLQ, Chata, who made third high YL score, placed second in last year's contest and third in '57.

Among the OMs, note that K9ALP and K6SXA reverse first and second place high scores in the phone and cw sections. K6SXA placed third on cw in last year's contest. Third place phone, W8AJW, Jack, made first place in '58, '57 and '55. Third place on cw, W5DQK, Shelton, is the OM of W5DRI, Dena, top YL phone scorer. Now there's family co-operation—one work the phone section and the other the cw!

W6DXI, Gladys, YLRL's vice president, who handled the contest, reported receipt of 140 YL logs and 259 from the OMs, though fa more than these numbers participated. Amon the comments we liked these: "Most of th gals are mighty fine operators. . . . not man points but had a lot of fun—gals, gals, ga —hi!"

YL-OM Contest Scores

YL PHONE

K1DGZ	26,633
W1RLQ	25,294
W1ICV	10,400
K1ADY	5,160
W1UKR	1,060
W1MDB	938
K2JYZ	4,763
W2EWO	4,200
W2OWL	423
WA2AKM	33
W3TNP	20,295
W3UTR/3	4,988
W3JST	2,106
W3GTC	1,520
K4IFF	27,540
K4TGA	21,717
W4QNI	19,345
W4BIL	17,325
W4WYR	17,039
K4ANY	15,435
W4WPD	10,500
W4KZT	8,425
W6QYL/4	924
K4WCZ (OP, W4EJQ)	360
W5DRI	70,088
K5BNQ	52,800
W5ERH	47,570
W5HWK	32,330
K5CRH	28,074
W5EGD	20,475
K5JXD	15,455
K5LIU	11,500
K5PFF	6,160
K5JCG	3,060
K0MET/5	2,625
K5EGB	2,430
K5MIZ	1,881
K6EXQ	46,967
W6QGX	33,880
K6TQO	18,420
W6JZA	18,400
W6WDL	11,224
WA6AOE	7,820
K6KCK	6,244
K6YOA	3,338
K6PWH	2,870
K6KUP	1,294
K6HHI	600
K6HOI	581
W7DRU	17,930
K7ADI	7,816
W7GGV	6,471
W7HXE	4,521
W7AKX	3,850
W7DIF	3,562
W7FDE	2,734
W7HHH	840
W7GXI	169
W8NDS	15,092
K8ITF	4,510
W8HWX	2,363
W8OTK	656
W8KLZ	553
W8LGY	248
K9AMD	5,775
K9BMP	4,690
W9VNG	3,000
K9BMQ	1,984
K0EPE	39,144
K5KUC/[illegible]	23,079
W0PSP	19,740
K0BFS	19,253
K0IGU	16,875
W0ZWL	13,219
K0HEU	12,773
K0IKL	10,402
K0GIC	9,100
W0WIE	7,215
W0LYV	5,063
K0LGW	275
KA2HA	675
KA2YL	1,768
KZ5VR	44,336
K6QPG/KW6	2,063
VE3DDA	700
KX6CM	11,907
ZL2JO	1,650
ZS5OB	1,475
ZS6APG	3,975

Confirmation only:
W3MDG, W6EHA,
K6ENK, G2YL

OM PHONE

W1BAB	1,680
K1HTK	1,540
K1EFI	1,259
W1LKG	1,680
W1LQ	1,050
W1LQQ	900
K1ADH	261
W1HOZ	242
W1NJL	96
W1OOS	96
W1VOE	68
W1MIW	56
K2DSW	2,751
W2GBX	2,059
K2DBB	2,015
W2COB	1,348
K2PTU	738
K2EIU	665
W2QCI	591
W2PEV	360
W2CVW	300
K2UZJ	270
W2IFI	200
W2GIX	130
K2UUT	114
W2MEO	83
W2LGK	55
W3BVL	3,176
W3FOX	2,520
K3DMO	2,048
W3ARK	1,782
W3QLW	1,485
W3EIW	1,470
W3MDO	544
W3KQD	358
W3IAN	88
K4JQR	2,213
K4DLC	1,705
K4IEX	1,563
K4ASI	1,286
K4DRO	893
W4WLM	700
W4SIB	675
K4MOF	585
K4WCZ (op, W4EJF)	405
K4MLE	385
K4EHF	360
W4KMS	286
W4JUJ	163
W5KEA	2,356
K5HGL	2,030
W5ZAL	1,719
W5GVP	1,365
K5BBA	1,175
K5JCC	1,080
W5KLB	1,080
K5OCX	1,075
W5VZU	950
W5NXF	600
K5BQS	420
K5INK	400
W5AWT	130
K6SXA	5,536
K6TXR	4,070
W6JVA	3,5
W6PVD	1,9
K6QYO	1,8
K6EIE	1,6
W6OII	6
K6GLS	5
K6ICS	2
K6CJF	1
W6SXX	
W5GVP/7	1,3
W7UGQ	1,1
W7YKQ	1,0
W7BCE	9
K7CLS	9
W7ESN	8
W7EVU	6
W7KOI	5
K7BSR	3
K7GQM	1
W8AJW	4,9
W8AYV	2,3
W8TN	1,5
W8WT	8
W8JIN	5
W8HNI	4
W8DEZ	1
W8KKV	
K9ALP	7,0
W9LNQ	2,4
K9HJS	1,3
W9YT (op, W9SZR	1,3
W9VCH	7
W9RKP	7
W9NLF	7
W9GWO	7
W9RYL	4
W9QLK	
K0LRS	1,7
W0LLU	1,2
W0ZSZ	9
K0IDV	9
K0IGO	8
W0QMS	7
K0AJR	7
K0LZJ	7
W0AQE	6
W0EQN	6
K0KKN	6
K0ESH	3
W0CDL	2
W0GAX/0	1
HP1AC	2
KP4KD	1,7
VE1DB	1
VE3AJU	5
VE3AZX	8
VE7VJ	2
VO2NA	

Confirmation onl
W1PR, W1ZTW
K2GTC, W3HK
W3YLL, K4OV
W6WLV, W7BZ
W7CQP W8BT
W8IF, W9AK
W0FJZ, HK5
SM7MS, KL7CX
VE3APM, ZL3

YL CW

W1RLQ	35,0
W3SLS/1	13,3
W1COL	8,
W2MWY	38,0
K2JYZ	11,5
K2ULP	7,9
K2UTS	3,8
W3CUL	24,0
W3JWM	18,4
W3TSC	11,8

K3CRE	10,499
W3UTR/3	5,780
K3EHZ	4,166
K4JYQ	13,780
K4SAF	5,348
K4TFL	3,671
W6QYL/4	1,250
W5EGD	19,208
K5LIU	15,468
W5WXY	4,165
K5PFF	2,438
W6WDL	9,713
K6OWQ	5,510
W6PCA	5,206
K6KUP	2,126
W6EHA	900
K6SYR	385
K6HOI	188
W7PTX	11,756
W7HXE	6,930
W7PUV	6,745
KN7EQM	2,646
W8QOQ	24,825
W8HAV	6,680
W8KLZ	288
W9MLE	8,405
W9USR	6,850
W9YT (op, K9BRJ)	3,400
W9MYC	2,406
W9OMZ	266
K0IKL	21,209
K0EDH	19,750
K0GIC	9,116
K0LYV	4,125
2YL	2,936
KL7ALZ	37,584
K6QPG/KW6	60
P5YL	1,410
E2AOB	1,188
E5DZ	9,847
L2JO	1,688
onfirmation only: K5ADQ, K6ENK, K6PWH, W8WQE, K6BQI0, W0LGG, VE3AJR	
OM CW	
W1OOS	858
W1BGA	680
W1MIX	543
W1SAD	518
W1FO	500
W1LQ	468
W1LQQ	368
W1OPZ	358
W1NLM	322
W1AZW	293
W1NJL	130
K1CAK	56
K2DSW	2,100
K2EIU	1,625
W2MTA	1,625
W2FLD	1,430
2UUT	1,300
W2EMW	1,260
W2SAW	1,222
W2CVW	968
K2GTC	761
W2NIY	840
K2PFC	680
W2LHL	552
W2DUN	489
K2MJM	261
K2PTU	168
W2DTL	125
W2CJM	90
K2EBO	44
K2OEG	44
W2LGK	25
K2UZJ	5
W3MDO	1,995
W3ARK	1,614
W3EIW	1,348
W3MFW	1,290
W3VTT	1,080
W3FOX	1,032
W3JO	825
K3ALL	630
W3ADE	500
K3AHT	469
K3CXX	440
K3DHX	420
W3CDG	403
W3UIU	40
W4JUJ	1,236
K4IEX	1,100
K4RJM	1,050
W4CHK	971
W4ZQK	765
K4PHY	648
W4CNZ	585
W4KMS	585
W4GOJ	350
W4SOT	220
W4IFT	90
W5DQK	2,103
K5JCC	1,482
W5KEA	1,210
W5VZU	825
W5AWT	792
K5OCX	412
W5ZAL	333
K5PFL	70
K6SXA	2,931
W6KAO	1,208
K6EIE	562
K6CJF	500
K6BFZ	187
K6GLS	63
W7ECX	665
W7VIU	540
K7APJ	413
K7BSR	193
W7WRT	193
W8AQ	1,820
W8YGR	1,500
W8UMP	1,380
W8JIN	1,350
K8GHG	1,294
W8APN	1,128
K8GWK	1,018
K8ERO	703
W8NAN	698
W8KKV	510
W8DEZ	195
W8LSJ	156
K8JLF	60
K9ALP	2,138
W9DYG	1,938
W9BZW	1,924
W9LNQ	1,924
W9RKP	1,440
K9PJN	1,275
K9BLY	1,265
W9NLF	1,208
W9GWO	1,150
K9ELT	750
W9CHD	698
K9JUU	653
W9WCS	612
W9YDQ	440
K9KNT	220
K9ASF	140
K9ICG	79
K0PIE	1,274
W0GAX/0	875
W0EQN	420
K0QLY	64
G3WP	11
HB9TT	31
IT1AGA	165
I1ER	11
KP4KD	309
LA6U	11
OH3TH	11
OH2RD	5
OH3RA	5
ON4EG	11
PA0IU	1
PA0VB	187
SM5BPJ	3
SM5AHJ	25
SM5LL	150
SP5ZA	50
VE1IDB	120
VE2AQO	276
VE2AIP	225
VE2AJD	11
VE2IL	488
VE3AJU	1,073
VE3AZX	698
VE3CWE	146
VE3DDU	553
VE3DLS	193
VE3DYJ	270
VE5NI	44
VK2PV	40
VO2NA	96
Confirmation only: W1YGR, W1VOE, W2FSL, W2NHH, K2ZYR, W3MGP, W3YLL, K6ITZ, W0TVI	

With the Clubs

Officers of the Loaded Clothes Line YL Net for 1959 are: Pres. & NCS, K0MNI, Linna; V.P. W0ZWL, Martha; S-T, K5ECP, Helen; Pub. Chm., W5RZJ; certificate custodian, K5GYZ, Lucille. The LCL, which meets Mon. at 0900 MST on 7235, now has 40 members.

The FLORIDORA YLs celebrated their 2nd anniversary Apr. 4 with a party at the Flamingo Hotel given by the Orlando Radio Club, KN4UIZ, hostess. The following day, during the Orlando Hamfest held at Sanlando Springs, the FLORIDORAs held their business meeting. Election of officers resulted in: Pres., W4UF-W4KZD, Dot; V.P., K4RNS, Marge; S-T, K4LOD, Margaret. New chairmen include: publicity, K4RNS; membership, W4BIL; historian, W4HRC; certificate custodian, W4WPD; cw Novice net mgr., KN4ANR; phone net mgr., K4LPV. Their cw net has been changed from Wed. to Fri. at 1330, 7185 kc. The FLORIDORAS now number 77 YLs.

The Texas YL Round-Up Net offers a certificate for contacts with 25 full members. QSLs must have members' TYLRUN certificate no. and date of issuance. Send QSLs to Bertha, W5JCY, 316 E. Hurd, Edmond, Okla. with an alphabetical list of claimed contacts, full name, cert. no., date of issuance, date, time and band of contact. Include postage to return cards by 1st class mail plus 10¢ for certificate. TYLRUN now has 122 members.

W6WDL, Babs (left), president of the San Diego YLRC, and K6YGJ, Marcia, were two of the YLs participating in operating the Ham station at Balboa Park during National Engineers' Week. Other YLs working with the OMs were K6UHI, K6UTO, K6QKE, W6GGX, W6MWU, W6VSL. Twenty-seven cities across the country were picked as representing a center of engineering activity with the net control center in San Diego. Three rigs were operated simultaneously on Feb. 26-28 & Mar. 1 covering 10, 15, 20, 40 and 75 meters, with SSB on 20.

These members of PARKA celebrated the club's 4th anniversary with a dinner party on Feb. 24, 1959. L. to r., seated: KL7CCP, treas.; KL7BVQ, pres.; KL7BLL, V.P.; Bonnie, XYL of AVF, secy. Second row: KL7CHV; WL7DAP; Fay, XYL of APV; Lillian, XYL of SFN; KL7ZR; WL7CZU; KL7BJD; KL7CVJ. Back row: KL7ALZ; Mary, XYL of BES; KL7CWF; Ruth, XYL of CHO; KL7ANG; KL7CSR. KL7ALZ, Geri, made 2nd high YLCW score in the YL-OM Contest. PARKA now has over 40 members. Photo by KL7BES.

YLs of the Los Angeles YLRC participated in operating K6USA in the lobby of the Biltmore Hotel during the month of April while the Consulting Committee of International Radio was holding forth there. . . . Club member W6UHA, Maxine, is up to 268 countries confirmed.

Congrats to W2KQL, Claire, and K5JGC, Burnette, and their OMs on new baby girls in their families.

"CQ YL"

The one and only book about the YLs, "CQ

[*Continued on page 90*]

RTTY

Byron H. Kretzman, W2JTP/0
2260 Matilda Street
St. Paul 18, Minnesota

Surplus has always been a boon to ham activity. We all know how the SCR-522 sparked activity on 2 meters. Not too many machines have appeared on the surplus market, however. RTTYers have been fortunate, though, in finding the Navy surplus FRA, FRC, FRE, etc., converters. Most of these are quite useful, if found in good condition, but make sure you have a strong back or a helper when you go shopping!

Lately the AN/FGC-1 and the AN/FGC-1X have become available. (The "X" version is for 25 to 60 cycles.) This little *Western Electric* gem is built into a 7-foot rack cabinet with front and rear doors. When you go to Surplus Sam's to pick *this* up, take along a fork lift as well as three helpers.

The AN/FGC-1(X) is designed to work with the dual diversity receiver bay AN/FRR-3 designed by *Press Wireless,* also in a 7-foot rack cabinet. The AN/FGC-1(X) works from the standard 2125 and 2975 cycle tones and an AFC panel, for use with the AN/FRR-3, is supplied in *some* units. Polar output is provided, as these units were usually installed at a remote receiving station with the machines located at a "signal center" a few miles away. This means that a polar relay must be used to key a local loop for operating your machine.

Several ingenious modifications have been made to adapt the AN/FGC-1(X) to amateur RTTY. As two AEC RELAY circuits are provided (one as a spare), some fellows have disconnected the diversity combining feature and have connected the A-CHAN to one of the REC RELAY circuits and the B-CHAN to the other. This effectively gives you two converters for the price of one. (!) One is then used to monitor an autostart AFSK channel on *vhf* while the other is used to copy on the *hf* bands, connected to your SX-101 or what have you.

Since polar operation is not necessary for ham operation, unless you have a remote receiving station, a fairly simple modification dreamed up by George Mellon, W0HFU, wil permit you to key your local loop with th contacts of the polar relay on the REC RELAY panel.

Figure 1 is the schematic diagram of *one* o the RECeive RELAY circuits as modified. O course, it is suggested that both circuits b modified. Note that there no longer is a con nection from the polar relay *space* coil (*3*) t relay *A* and that resistors *J* and *K* are discon nected. The very effective *88D* FILTER is lef in the contact circuit, as are the other R contact noise suppression components *A*, *B*, *D* *E*, and *H*. The *TST* switch, *552A*, has bee rewired to serve as a normal-reverse switc should a turn-over be necessary for some ob scure reason, therefore the polar mark-hol circuit using relays *A*, *B*, and *C*, is no longe operable. This greatly simplifies operation.

Chicago

The CATS will be holding their annua National CHI-RTTY Meeting this coming fal as usual. No date has as yet been announced but it will probably coincide with the annua

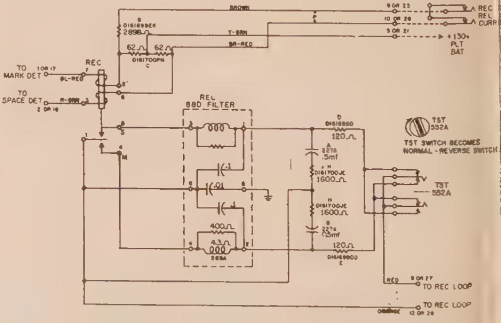


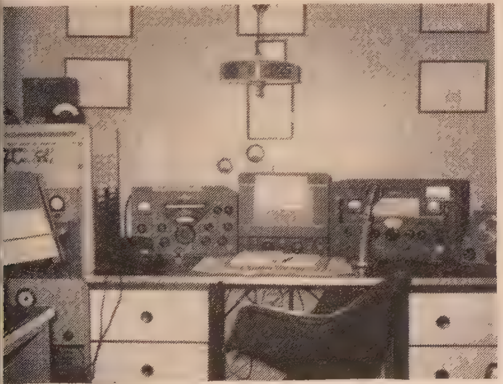
Fig. 1—Modified Receive Relay Panel of the AN/FGC-1(X).

ational Electronics Conference. This will be e 5th National CHI-RTTY Meeting, and e can expect the customary bang-up tech-cal meeting, exhibits, and awards. (Your TTY Editor speaks from experience as he s missed only one of these affairs.)

Last year the attendance award was a Model 5 machine. *This* year, the attendance award a *Model 28!!!* This is only one reason why TTYers travel from east, west, and south, d from Canada, just to attend this great get-gether of all active RTTYers. Watch for fur-er details; date, time, and place, etc. Mark on your calendar, and if you can't find out here and when in a month or so, write George oyd, W9SPT, 3540 N. Seeley, Chicago 18, Il-nois.

Narrow Shift Party

W0BP reports great experience in NFSK uring the informal Narrow Shift Party the eek-end of March 14-15. BeeP very easily dapted his AN/FGC-1 to NFSK by building a set of simple over-coupled-pair filters with *ark* centered at 2465-cycles and *space* centered 2635-cycles. No changes in AN/FGC-1 cir-uitry were needed due to the excellent patch-g facilities in this 7-foot TU. Input to the 70-cycle filter went to jack CUR LIM OUT, e *mark* output to the M DET IN jack, and e *space* output to the S DET IN jack. Easy, uh?

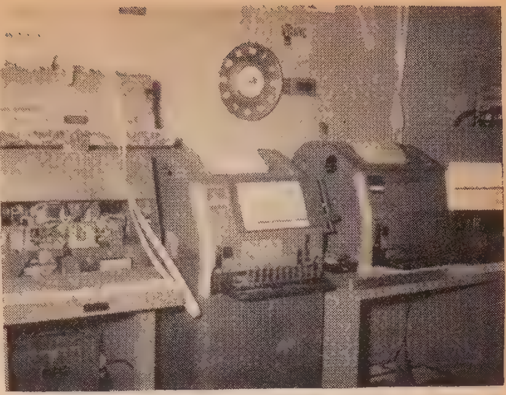


W8HYG, RTTY Machine Positions. Printers: Two Model 15 Page Printers; Tape Gear: Model FRXD-3 Reperforator-Transmitter, Model MXD-13 Multiple Tape Transmitter

Stations worked using narrow shift were W8-EX, W5BJO, W0GK, W1OUG, KR6AK, and 6CQI/6. A good time was had by all, with any things learned; most of all things were arned about stability, in both receivers and ansmitters.

Across the Nation

W1WIN has two Model 14 strip printers, an X-101 with a W2JTP TU, an HT-32, and a 00-L linear. K2DFP "regrettably" sold his TTY gear in 1957 and is now on the way back back. (*They all never left home!*)



W8HYG, Receiver and Operating Position. Operator: Allan Amster. Location: Shaker Heights, Ohio. Receivers: 75-A4, SX-24. Transmitter: 32V3. Antennas: 40-meter dipole, coax fed, 20-meter 2-element mini-beam, 10-meter 3-element beam. Converter: CV-57, if type.

John Riley, 914 N. Cordova Street, Burbank, California, would like to trade *Teletype* bulletins 126, 167, 1077, and 1093 for TM 11-680 and for data on the Model 12 and on the Model 19.

W7OQY now has a Model 14 typing reperforator. W7GLJ, Box 266, Athena, Oregon, wants to buy an AN/FRR-3 receiver bay real bad. W7HRC is a reliable source of parts in Seattle, Washington. (Machines, too, when available.)

W9GRW, 8029 Keeler Avenue, Skokie, Illinois, has for sale various Model 28's (yes, I said *28's*) and Model 14's, including tape gear.

K0KAX, 8720 N. DeSota Street, Denver 29, Colorado, has several TG-7's (Military Model 15's) for sale. W0WTP has a Model 15 with holding magnets for sale. W0IFS got his TG-7. W0IBZ uses a Model 26, a Viking I/II, an NC-300 with a W2JAV (*CQ,* April '58) converter on 40. W0AJU in Denver knows where some Model 26's are, and they are still available, according to W0BP.

Comments

In case you fellows haven't noticed, your RTTY column is now on a bi-monthly basis. (Not enough of you RTTYers filled out that readers poll form in the January issue.)

As originally stated when the RTTY column began in 1955, the purpose of the column is to bring you small bits of technical information as well as news and views of RTTYers across the nation. The mail bag tells me that you still like this format. In fact, many letters ask for even more diagrams. These come from you, the *active* RTTYers. Keep 'em coming, and throw in a picture of your shack occasionally. Give the "unwashed multitude" a chance to see how the other half lives. See you all in August.

73, Byron, W2JTP/0

VHF

by Sam Harris, W1FZJ
P.O. Box 334, Medfield, Mass

50mc. 144mc. 220mc. 420mc. and above

Some winters just seem to be tougher than others. I feel safe in saying that the antenna mortality in the last six months has been the highest in recorded ham history. From Maine to California come reports of high winds and heavy ice loads wreaking havoc among the faithful. Even poor Helen has been reduced to one measly 16 element six meter beam. Be not disenheartened however, because at long last spring is here and with it comes a revival of the annual spring antenna raising parties.

How High?

The first problem to be overcome is the old boogie antenna height. In *vhf* work it is safe to say the higher the better, but it doesn't answer the question. If you can support a 4 element beam at a hundred feet will it work better than 8 elements at 50 feet? Or should you have 16 elements at 35 feet?

Of course there is no simple answer. If you want a top notch ground wave signal your antenna must be high (and so should your location). If you want to work beyond the normal ground wave distances using aurora or other such types of propagation, the antenna should have the maximum gain and height shoulid be considered as secondary. If your antenna is high enough to clear all the buildings and trees in the immediate vicinity, you will gain very little by going higher.

How Big?

There is no question that the most return per dollar is obtained from your antenna investment. It is also true that the art of building your own is a thing of the past. I can remember being ashamed to admit that I bought my antenna elements pre-cut and mounted. Now-a-days the tendency is to apologize for having a home made antenna. The truth of the matter is that you can buy an antenna all built and ready to feed for less than the price of an equivalent amount of material. (To say nothing of the work involved in designing and assembling your own.) Your only problem is to decide how much you have to invest to make your station perform satisfactorily. There is a tendency to measure antenna performance in terms of the number of elements it has. This is a measure of an antenna's capability providing the elements are properly used. However, if you are considering a yagi type antenna, remember that the gain is going to be a function of boom length. The number of elements on the boom are important but having twice the elements on the same boom doesn't give twice the gain. In some cases the gain might be less. A good rule of thumb is an element every 0.2 wavelengths. Closer spacing than this is not going to give you any more useable gain and the decreased frequency range is not desirable for *vhf* work. The gain you can expect from a yagi is best estimated in terms of boom length. A good figure is 10 *db* for the first wavelength of boom and 3 *db* for each additional wavelength. This rule is consistent with any reliable handbook on antennas. (Makes you wonder where they get these 12 *db* gain figures for some of the commercial 20 meter beams. 65 feet per wavelength.) Now if you have one antenna with some gain and you want to get more gain, you can use rule number 3 which says you must double the size to get 3 *db* more gain. How you double it is not important. If it is a yagi, you can for instance make the boom twice as long, or you can stack another one of the same size above it. If it is a colinear array, you can either put another one over (or alongside) it or you can double the length of the boom (adding the appropriate elements of course).

One thing to remember when you are increasing the gain of your antenna: Longer booms result in narrower horizontal beam widths (as well as vertical), while stacking beams only effects the vertical beam-width. If you want to have maximum coverage the stacked arrays are to be preferred. If you don't want people to hear you unless you are pointing at them, increasing the boom-length is the answer.

Please Note: Your antenna is the only piece of equipment in your shack which gives gain on both transmitting and receiving.

Announcements

ICN VHF QSO Party 220 MC

The Inter County Net of Southern California is sponsoring it's first VHF QSO party at 1300 PST on June 13th and will continue until 1600 PST on June 14th. Suggested frequencies for contacts are from 221.2 to 221.6 *mc*. On the air call 'CQ ICN QSO Party." Both horizontal and vertical beam polarity will be used. Schedules are invited with stations who are dx for this area and expect to operate on 220 *mc* this date. For further information write to Ralph Steinberg, K6GKX, Net Man-er, 110 Argonne Ave., Long Beach 3, Cali- nia.

New Certificates

om Texas

Rules for receiving the "COWTOWN 6 ETER DX CLUB" certificate from Ft. orth, Texas, are as follows: Any DX or skip tions must work 10 members of the net. Any als (defined as being anyone living within) miles of the courthouse in Forth Worth) st work 15 members of the net. Application certificate should go to Betty Becker, MJW, secretary of the club. Other officers J. L. Pickle, K5BBG, President and H. E. oc" Becker, W5GNK, Vice President.

oenix VHF Certificate

"The Phoenix VHF Radio Club Incor- rated" is now issuing Phoenix VHF Certifi- es to any person who has ten (10) con- ned contacts with members of the Phoenix IF Club since January 1, 1959. There are members in the club at the present time.

A list of stations worked, date and the time contact is required for the certificate. Send information to Booth G. Bazzill, W7GGJ, 'y Phoenix VHF Club, P. O. Box 6602, oenix, Arizona.

Mail

ndsor Central School—Code Practice

The "Windsor Central School Amateur Ra- Club" holds straight text code practice sions every Saturday evening at 2000-2030 T. Speed begins at 5 *wpm* and is increased word every week until 13 *wpm* are ched. When 13 *wpm* are completed the le is repeated, beginning the following week in with 5 *wpm*. Frequency is 50.178 *mc* l the emission is modulated CW. If enough ponse is received, a 2 meter frequency will be used simultaneously.

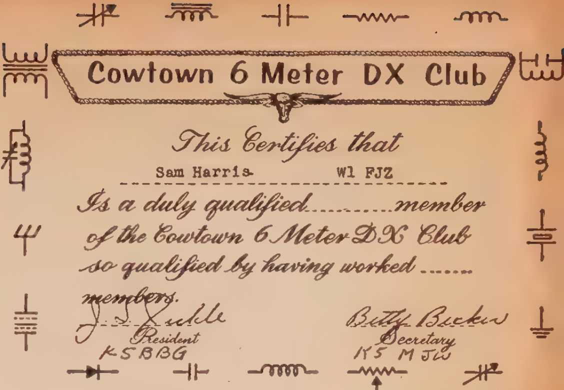
e Badger VHF Club—Milwaukee, Wisconsin

A new club formed to maintain the monthly HF News" edited and published by George ehler, K9IQO. Officers are: George Boehler, IQO, Pres.; John Considine, W9MMA, Vice s.; Patsy Nikodem, K9LMW, Secretary; y Weisbrodt, W9JCI, Program Director.

chorage, Alaska Our truant report (?) Jack ch, KL7AUV comes through again with: "I've really fallen down on my reporting year." *"How true! And we've missed you*

.

"Last good signals on F2 were again Febru- 1st and they weren't good. Am still hold- schedules with W7RT (March 8, '59) in ttle on week-ends, but don't hold much e for them unless we can go to the wee- ll hours of the morning. Our Channel 2 been heard in the Pacific Northwest during 2 to 4 AM period several times during the



Cowtown 6 Meter DX Club

This Certifies that

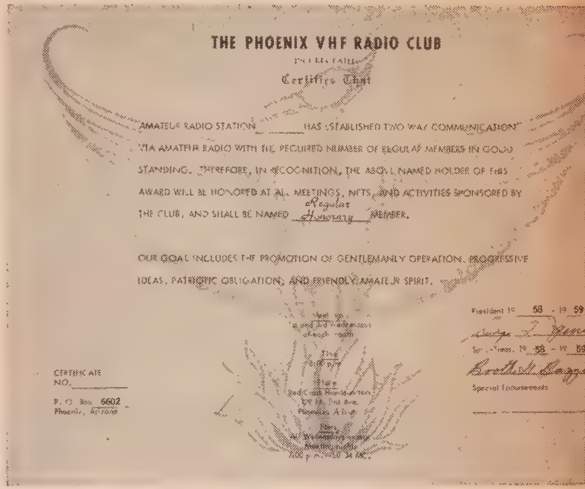
Sam Harris W1 FJZ

Is a duly qualified..........member of the Cowtown 6 Meter DX Club so qualified by having worked .... members.

J. L. Pickle
President
K5BBG

Betty Becker
Secretary
K5 MJW

Texas "Cowtown" Certificate.



THE PHOENIX VHF RADIO CLUB

Certifies That

AMATEUR RADIO STATION ______ HAS ESTABLISHED TWO WAY COMMUNICATION VIA AMATEUR RADIO WITH THE REQUIRED NUMBER OF REGULAR MEMBERS IN GOOD STANDING. THEREFORE, IN RECOGNITION, THE ABOVE NAMED HOLDER OF THIS AWARD WILL BE HONORED AT ALL MEETINGS, NETS, AND ACTIVITIES SPONSORED BY THE CLUB, AND SHALL BE NAMED ~~Honorary~~ Regular MEMBER.

OUR GOAL INCLUDES THE PROMOTION OF GENTLEMANLY OPERATION, PROGRESSIVE IDEAS, PATRIOTIC OBLIGATION, AND FRIENDLY AMATEUR SPIRIT.

CERTIFICATE NO. ______

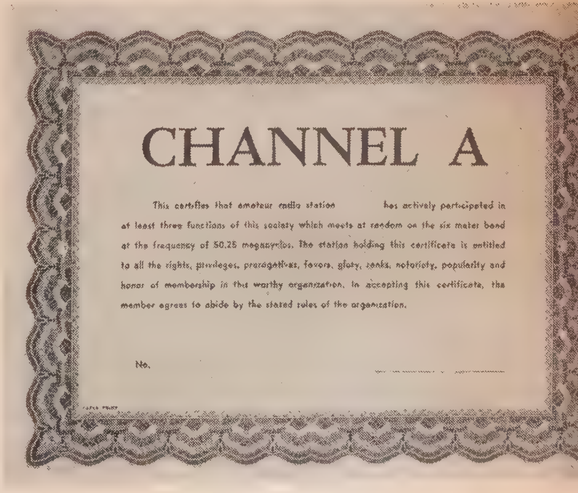
P. O. Box 6602
Phoenix, Arizona

President 19 58 - 19 59

Sec.-Treas. 19 58 - 19 59

Special Endorsements

Phoenix VHF Certificate.



CHANNEL A

This certifies that amateur radio station has actively participated in at least three functions of this society which meets at random on the six meter band at the frequency of 50.25 megacycles. The station holding this certificate is entitled to all the rights, privileges, prerogatives, favors, glory, ranks, notoriety, popularity and honor of membership in this worthy organization. In accepting this certificate, the member agrees to abide by the stated rules of the organization.

No.

"Channel A" Certificate, referred to by K2ZSQ in his letter.

past two summers." *Now let's see, your summer is————.*

"Will be in Towson, Maryland, during the week of March 16th to 20th and hope to meet a few of the 50 *mc* enthusiasts. Am planning on seeing KL7CDG, Jim, who is in College Park, Maryland, but is due back up here in April."

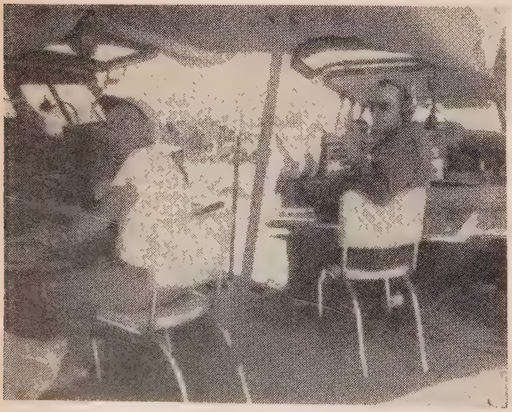
"Margie, KL7BLL, is in Northern California with the kids and I will join them March 21st to start a vacation of several weeks in Southern California. We will be back up here about the middle of May. Hope to have a 6 meter Communicator with me for the whole trip. We'll drive back up the highway about May 7th to 15th."

"Have worked only W1AEP, W3RUE, W3APR, since Statehood (in that part of the country), am still wondering what happened to W4IKK. Know I would have heard him if he had been on." *Thanks very much for your nice informative letters, Jack. We all enjoy your comments.*

Territory of Hawaii Dave Germeyer (W3BJG/KH6) comes through from a distance also. Dave sez: "I've been in Uncle Sam's Navy for almost three years now and haven't been too active on the *vhf* bands except when home on leave. However, on the 15th of March I finally got on 50 *mc* and during the first three hours of operating on the new rig I worked some of the local hams here in Hawaii and hit an opening into VK4 and VK9 land." *Beginner's luck!!*

"The present set-up here is: Heathkit Seneca, Tapetone XC-50 into a Hallicrafters SX-100, and a five element beam up about sixty feet. Am planning to get on 144 *mc* also in the near future."

"Due to work skeds, I'll be unable to make skeds but will be looking for the whole gang when the Mainland stations come through again this Fall." *Nice to hear from you at the new (temporary) location, Dave and hope yo good luck continues.*



Avid contesters at work. To the right Joe Wingen (K6GPG) operating and winning on 220 mc. To the left Carl (K6DWX), operating six meters and rounding up with a good score. Location—top of Sierra Peak, Cleveland National Forest, Calif.

Sointula, British Columbia Since the MUF h gone down we're forced to hear from I (VE7AQQ) via the post-office and here is news. "The band has been dead here sin January 17, 1959. Things would be very d if it were not for John, VE4OB, who is n on six meters. On February 22nd I was calli John on schedule with no luck, *but* about week ago I contacted VK2ADE on ten met and he told me that he heard me in Austra at that previous sked date and gave me a port of 5 by 7."

"Since then we have been maintaining da skeds on six meters at 2:30 GMT, have hea carriers but nothing that can be identified."

"Charlie, VK2ADE, has also read VE7A in QSO with someone else, and said t KR6AK has also reported hearing my calls."

"One more bit of news, the VK's are wo ing Japan every day, sometimes from 1000 u til midnight, Australian time." The above let was dated March 17th, the following was da April 8, 1959: "Thought you might like know that after nearly a month of ske VK2ADE and I, VE7AQQ, finally made c tact on six meters last night at 2105 PST. T initial contact was on ten meters and then went to six. The signals came in bursts, a f words at a time, something like meteor scatt with signals about S8 at the peak of the bu VK2ADE gave me about the same report. are going to continue our skeds in the ho that sooner or later will be able to carry o long QSO on six meters."

"I am running 150 watts of carrier and 3 watts of audio now, whereas Charlie, VK ADE, is only running 12 watts on a freque of 50.400 *mc*."

"I had a similar contact with TI2CV March 28th, but signals were only about S *Congratulations Ike! Some more firsts for y VK to VE7 and TI to VE7. Sometimes I w der if this is such a good location.*

Korea Howard Ragan (K7ATU) emits Uncle Sam's carrier: "Here I sit on a Rem site with a legal ham ticket that I can't u but in spite of that I would like a little formation."

"What would be the best transmitter six meters? Also, what would be a good (if better) receiver? The transmitter I want wo be a kit of $mall co$t, but reasonable pow 10 to 50 watts. The receiver should be s sitive enough to do a good job for 6, I thinking of an HQ 170." *I've given Howie ideas, now how about some of you other lows?*

"Here in Korea I hear now and ther HL9KA but can't get permission for h radio here." *What luck! But that seems to the way the ball bounces.*

[*Continued on page 90*]

Announcements

Biloxi, Mississippi

The Biloxi Amateur Radio Club, Inc. will hold its annual Hamfest on 6-7 June at the Biloxi Community House. There will be contests, prizes and a Shrimp Boil on Sunday, 7 June. Tickets are $1.00 each. For more info write BARC, Box 1574, Irish Hill Station, Biloxi, Miss.

Van Nuys, California

The San Fernando Valley Radio Club, Inc. will hold its 3rd Annual Hamfest and Picnic on Sunday, June 7, 1959 at the Victory-Van Owen Park, North Hollywood, California. For further information contact Arnold Dahlman—W6UEI, 14940 Hartland Street, Van Nuys, California.

Mexico City

Former U. S. radio amateurs now living and working in Mexico City meet with Mexican amateurs every second Wednesday of each month at 1 p.m. in the University Club there at an informal luncheon to promote interest in their hobby. This picture was taken at the February luncheon. Seated, left to right, Francisco Castro Herrera, XE1AX; Clyde A. Warne, XE1IG, and David R. George, XE1RE. Standing, Donald E. Stoner, XE1DE; Louis Couttolenc, XE1XE; Kirt E. McCleary, XE1ZE; Edward J. Rudishule, XE1ZM; Vernon T. Dickins, XE1FE; Eugene McAuliffe, First Secretary of the U. S. Embassy, and Louis E. De la Fleur, XE1YF. Visiting hams from the States and other countries are always welcome to attend the luncheon, and should telephone Clyde Warne at 46-07-14 or Dave George at 46-18-96. The Mexico City gang is active on all bands with CW, AM, SSB and RTTY. All are members of the LMRE (Liga Mexicana de Radio Experimentadores).

Barnstable, Mass.

The quarterly meeting of the Cape Cod and Island Radio Association was held in Barnstable, Mass., with more than fifty amateurs in attendance. It was reported that there are now 180 members and 16 associate members in the group, from the Cape, Martha's Vineyard and Nantucket.

Robert E. J. West, W1MKW, of Dennisport, newly elected president of the Association, presided at the meeting.

Other officers present: vice-president Robert Mill, W1DVS, of Falmouth; secretary-treasurer Charles Goff, W1EGZ, of Pleasant Lake.

Farmington, New Mexico

The Totah Amateur Radio Club of Farmington, New Mexico will holds its annual Hamfest and Picnic on July 4 and 5th at Pine River Dam, Vallecito Res., which is about twenty miles northeast of Durango, Colorado. This is a wonderful place for an outing, plenty of free campsites, boating, water skiing, horseback riding and cabins at nominal fees. Besides bringing along some extra gear to swap off, bring that fishing rod and reel; they promise us good fishing. Just follow the CQ markers to the campsite. Further details may be secured from W5CIN.

Oglesby, Ill.

The Starved Rock Radio Club Hamfest, June 7th at the La Salle County 4-H Home and picnic area southwest of Ottawa, Illinois. Same place as last year. Follow Route 23 to south end of the Illinois River Bridge at Ottawa, turn West on Route 71, follow big yellow hamfest signs. Plenty of parking area and adequate facilities for all. Free swap section run on the same basis as last several years. Registration $1.50. Hamfest site is a short drive from Starved Rock State Park and recreation areas. Food available on the grounds. Free coffee and doughnuts for all present at 10 A.M. A nice all-day affair for midwest hams and their families sponsored by the Starved Rock Radio Club, W9MKS, RFD #1, Box 171, Oglesby, Illinois.

Elkland, Pa.

The (PENN) York HAMFEST ASSOCIATION will hold their first hamfest June 20th Sat. beginning at 1 PM. It will be held at the Elkland Legion Hall in Elkland, Pa. A beautiful spot for a hamfest. A terrace overlooking a public swim pool and picnic area. Large parking lot with room for all. There will be speakers, mobile contest, prizes and a chicken dinner. A free bus trip to the Corning Glass Works will be available to the ladies. The price is $3.50 pre-registration and $4.00 at the door. Tickets may be obtained by writing to Bob Schmarder, 4 Pinewood Circle, Corning, New York. Limited number of reservations

Dickinson, North Dakota

The T. R. (Teddy Roosevelt) Amateur Radio Club of Dickinson will be host at the state convention and hamfest to be held at the Theodore Roosevelt National Memorial Park, Medora, North Dakota on July eleventh and twelfth. The "western" theme of the convention will be highlighted by tours through the badlands and Chateau De Mores. Persons in attendance will be given the opportunity to see the famed out-door drama "Old-Four Eyes". To add to the festivities, there will be outstanding speakers and a large number of valuable prizes. Pre-registration has been set at five dollars which will make the individual eligible for the pre-registration prize. For further information, contact Quain Jahrman, K0MEF, Box 1101, Dickinson, North Dakota.

Rockville Centre, New York

"The South Side Radio Club will hold its Second Annual Teenage Hamfest on June 6 at the South Side Senior High School, Rockville Centre, L.I., New York. The activities for the "pre-voting age" gathering will commence at 10 A.M. and will include films, contests, an equipment exchange, 2 & 6 meter hidden transmitter hunts, demonstrations, and W2DEC, DX editor of CQ, as speaker. Tickets can be bought for 75 cents at the door. Information is available through John Cunitz—K2TBU, 10 Buckingham Road, Rockville Centre, New York.

San Jose, California

Prizes, fun, something for everyone, will be featured at the Pacific Division A.R.R.L. Convention in San Jose, California July 3, 4 and 5. Pre-registration prize will be a Hallicrafters HT-32 and a special feature will be a lady's pre-registration prize, a major appliance.

Main speaker at the affair will be Goodwin L. Dosland, W0TSN, who will talk on amateur radio and the A.R.R.L. Technical talks will cover many areas of amateur interest, including SSB, RTTY, DX, VHF, traffic, emergency communications, receiver design, antennas, transistors, mobile, and many others. A new feature will be a "ham" golf tournament with prizes for the winning ham golfer. Those persons interested in this event should contact the Golf Committee, P.O. Box 6, San Jose, Calif., before June 15. On July 5 the convention finale will be a steak BBQ complete with all the trimmings, following the San Jose tradition.

Finest hotel and motel facilities are available in the San Jose area, and the St. Claire Hotel will be convention headquarters. For further information write Associated Radio Clubs of Greater San Jose, P.O. Box 6, San Jose, California.

Webster City, Iowa

The annual Iowa 160 meter sponsored hamfest will be held in Webster City, Iowa, Sunday, June 28. About 1000 operators and their families are expected to attend.

SURPLUS

by **KENNETH B. GRAYSON, W2HDM**
Care of CQ 300 West 43rd Street, N. Y. C. 36, N. Y.

On a rainy Saturday, in New York, when there is little else to do (ha!), it is usually most profitable to stray around Radio Row as we call the Cortlandt Street area. Today it is raining, as it usually does the day after the car is washed (47 weeks in a row) and the visit to Radio Row proved to be most profitable. For instance we stopped in to see Sy Denby at Metro Electronics, 172 Washington St., New York City. Last time we were there he showed us the carrier operated panel we converted back in January 1959. He showed me another worthwhile conversion of the same piece of gear so it can be used as a VOX . . . voice operated break-in. He got this from Fullerton Webster W2BA, down in Boonton, N. J. Figure 1 shows the corrected circuit and it works like a charm. The basic panel still sells for five dollars plus postage and is brand new too.

The primary of the transformer, T-1, is connected across the primary of the speaker transformer for anti-trip voltage. The input to VT-1 is connected at some point in your speech amplifier where there is at least one volt of audio (with respect to ground) present. Incidentally, that becomes point 1 on the terminal board. Point 2 is grounded and a 4 meg resistor (a 4.7 meg will do fine) is connected across the grid. The grid is also disconnected from point 1 and is reconnected to cathode of VT-2. A second potentiometer is also added across the secondary of T-1 to allow the anti-trip voltage to be adjusted as necessary. C-7 should be changed to 20 mfd at 250 VDC, observing the polarity as shown. The relay contacts may be used in any manner necessary to key your transmitter.

Phone Patch

Sy managed to pull a second little gem out of the hat. Seems that he was successful bidder

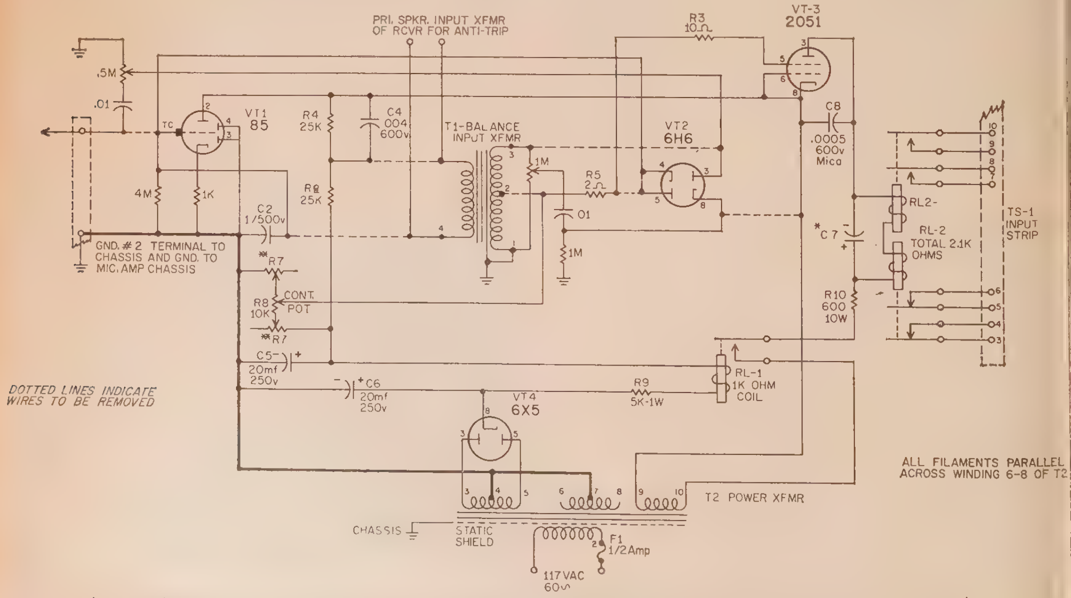


Fig. 1—Circuit of the Type 3-A Carrier Operated Speaker Control Panel modified to operate as a VOX. It was designed by W2BA, Fullerton Webster. The input to the .5 meg pot (in the upper left corner) is taken from some point in the speech amp that can supply 1 volt of audio. Capacitor C7, in the plate of VT-3 must be replaced by a 20 mf at 250 volts.

a batch of amplifiers for use with telephone uipment. As if this wasn't good enough he owed one to W2AQA who realized what it ally was and devised a terrific phone patch it of it. Referring back to the CQ 1957 An-al (November 57 issue) W2TBZ wrote an ticle called "Hybrid Husbandry". In this ticle a complete phone patch is described, d lo and behold the amplifier Sy came up th seems to be almost identical. The am-fier is officially known as the EE-89A, and quires only the addition of a 1 henry choke, d a couple of minor parts which will prob-ly come right out of the scrap box. No ubt the choke will also be around the shack the form of a 6V6 output transformer with e voice coil connection unused. The wiring the new parts into the circuit will take a few nutes and are completely self explanatory ce you look at the schematic after conver-n (fig. 2). Figure 3 is the original EE-89A. e tube (3Q5) is unused, and the socket and nnections to the tube can be deleted or the be can be removed as you see fit. Oh yes, forgot to mention that the price of this le gem is only two dollars, plus postage hich is a pretty cheap way of getting a class phone patch, and one that will work with X units, no-less.

Surplus on the Citizens Band

We have had many requests for information garding the conversion of various equipment the Class D Citizens Band service. Specifi-lly, this band is the old eleven meter band, th power output limited to five watts input the final stage. The transmitter is required be crystal controlled and amplitude modu-ed. A complete set of laws governing this w service are available from the FCC for a ne, under the title of Part 19, Citizens Radio rvice.

Several equipments seem to be made just for this application after a very minor modification, while other equipments would require substantial modifications. The BC-620 and its slightly higher frequency counterpart, the BC-659, as well as the BC-1335 are excellent mobile units, while the BC-603 receiver, when converted to AM is a fine tunable receiver for a base station. The BC-604 has drawbacks of size and power output for worthwhile conversions. In almost every case the services saw fit to make use of FM as a transmission method. This poses the problem of having to change limiters to *if's* suitable for AM and to alter reactance tube modulators to prevent unwanted frequency changes. Likewise, many of the equipments, such as the 659, 620, 1335, etc. made use of oscillators kept on frequency by the reactance tube across the oscillator. This tube was in turn fed a signal derived from the output signal and converted to the *if* by a crystal converter If the signal base frequency shifted, the *if* frequency shifted accordingly, and the dc from the discriminator operated to bring the signal back to where it belongs by means of the reactance tube. Since the law requires crystal control, these free running oscillators must be altered to a crystal controlled type. To make matters even simpler, we have decided that since most of the installations of this equipment in Class D service will be used on one frequency only, there is little need for a tunable receiver. Perhaps later on we will experiment a little further and get the tunable receiver type going.

Since all of the equipments are to be operated in 27 *mc* class D service, and these equipments all have the same type of 4.3 *mc if,* Table I lists all of the data needed to compute the crystal frequencies. Since these equipments each have provision for operation on two separate frequencies, they may be tuned up on any frequencies shown as being assigned. Joint use

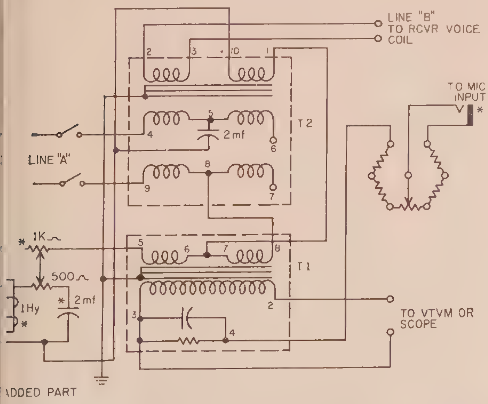
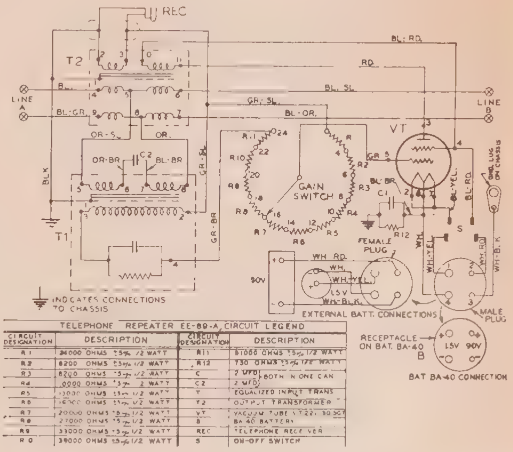


Fig. 2—Modified circuit of the EE-89A Telephone-Amplifier. (Original wiring shown in fig. 3.) With the removal of the 3Q5 and the addition of several parts an excellent phone patch may be had.


REC
T2
LINE A
LINE B
VT
GAIN SWITCH
T1
INDICATES CONNECTIONS TO CHASSIS
FEMALE PLUG
EXTERNAL BATT. CONNECTIONS
MALE PLUG
90V
RECEPTACLE ON BAT. BA-40 B
1.5V 90V
BAT BA-40 CONNECTION

TELEPHONE REPEATER EE-89-A CIRCUIT LEGEND

CIRCUIT DESIGNATION	DESCRIPTION	CIRCUIT DESIGNATION	DESCRIPTION
R1	24000 OHMS ±5% 1/2 WATT	R11	51000 OHMS ±5% 1/2 WATT
R2	8200 OHMS ±5% 1/2 WATT	R12	750 OHMS ±5% 1/2 WATT
R3	8200 OHMS ±5% 1/2 WATT	C	2 MFD BOTH IN ONE CAN
R4	10000 OHMS ±5% 2 WATT	C2	2 MFD
R5	13000 OHMS ±5% 1/2 WATT	T	EQUALIZED INPUT TRANS
R6	16000 OHMS ±5% 1/2 WATT	T2	OUTPUT TRANSFORMER
R7	20000 OHMS ±5% 1/2 WATT	VT	VACUUM TUBE VT224 3Q5GT
R8	27000 OHMS ±5% 1/2 WATT	B	BA 40 BATTERY
R9	33000 OHMS ±5% 1/2 WATT	REC	TELEPHONE RECEIVER
R10	39000 OHMS ±5% 1/2 WATT	S	ON-OFF SWITCH

Fig. 3—Original circuit of the EE-89A.

Table I
Frequency of Transmission (MC.)

26.965	27.055	27.155
26.975	27.075	27.165
26.985	27.085	27.175
27.005	27.105	27.185
27.015	27.115	27.205
27.025	27.125	27.215
27.035	27.135	27.225*

*(Used on a shared basis with control equipment)

To determine crystal frequencies:
Xmitter Freq: Divide output frequency by 4.
Recvr Freq: Subtract 4.3 *mc* from output frequency and divide by 4.

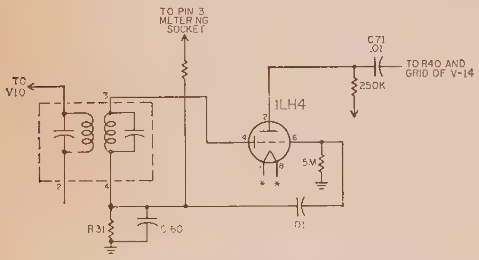


Fig. 4—AM detector and audio stage.

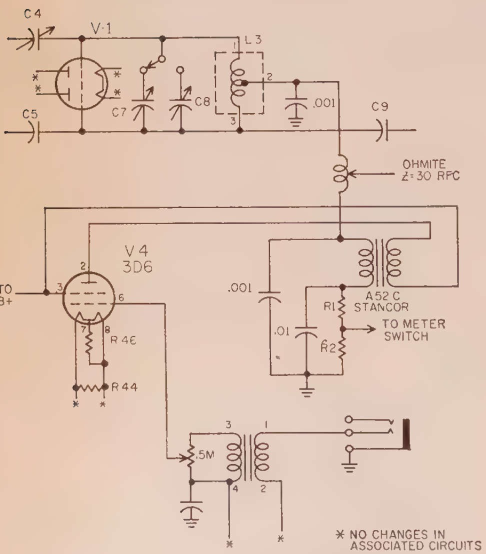


Fig. 5—Grid leak modulator.

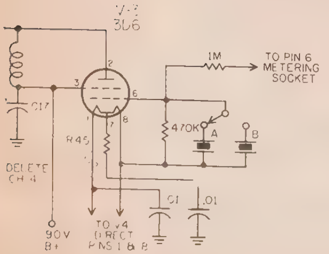


Fig. 6—Transmitter oscillator

of any frequency make this a worthwhile feature because in any area where the number of users is great, the possibility is always present that someone will be on your favorite frequency when you want to use it. The FCC will allow operation only on these frequencies and none others. Each equipment must be licensed and full information about licensing requirements are in the set of laws previously mentioned. Remember, that just as with amateur equipment you must be licensed, or you will be subjected to such action as the FCC may deem necessary.

Now, the conversion of the BC-659. Last month we discussed the general tune up and operating characteristics of this equipment, so we won't go over the details again. We also included a circuit diagram as well, of the entire equipment. The receiver *rf* sections and the transmitter final stage will remain untouched except for modulation.

The audio, detector and limiter stage must be revamped in order to allow the receiver to detect AM. The 1LH4 in the set (V-13) should be removed and placed in the socket V-11. V-11 (1LN5) is not used. Instead the circuit shown in fig. 4 is wired in, replacing the original circuitry. This means the removal of R-34, C-62, C-63, R-35 and R-36. Likewise T-5 could be removed, except that it would leave a chassis hole that would be unsightly. V-12 (1R4) serves no purpose and could also be removed. Likewise, remove R-37, R-38, R-39, C-69 and C-70. C-71 is used for coupling, and the side going to the junction of C-70, R-37 and pin 7 V-12 should be connected to pin 2 of the ILH4 we are now using as our detector and first audio stages. If reception is too broad, as it may well be, you can improve the sensitivity and the selectivity simultaneously by removing the resistors R-27 and R-30. These are located within the *if* transformers T-2 and T-4 and will require removal of the shield-can in order to accomplish this. It may also be necessary to realign the *if* transformers after removing the resistors. The intermediate frequency is 4.3 *mc.*

The receiver *rf* and mixer stages are already at the correct frequency. There are no changes necessary in any of the equipments, since there is sufficient overlap in the band of each. We purposely left the receiver crystal controlled so that there would be no drift of tuning—especially in mobile service and also in consideration of the fact that the channel spacing is so close. We were fortunate to have crystals made for us at V-Precision Crystal Co. Elmhurst 73, N. Y. They made the shunt mode crystal to the 0.005 tolerance necessary, at a very nominal price.

The transmitter must be crystal controlled in order to comply with the FCC regulations of the Class D service. To make the oscillator comply with regulations it will be necessary to rewire it. This involves removing the reactance circuits, such as C-22, CH-5, and R-9 so as to llow the reactance tube to be used as an audio mplifier. The emphasis network in the grid ust also be deleted. This means removing R- 2, R-13 and C-27. A one-half megohm po- ntiometer should be mounted on the front anel and wired in across the mike trans- ormer, T-1, to allow for modulation control. he potentiometer arm should be connected to in 6 of V-4. Mount a small transformer on e chassis near the rear where there is suffi- ent room. This is used to grid-modulate the ansmitter. This type of modulation was osen so as to prevent having to add a more xpensive modulator of the transistor or tube pe for full plate modulation. The efficiency f grid modulation is not as great as you ould find in a plate modulated set, but the ower output is not reduced appreciably. The ansformer is a Stancor type A-52C, although ny small single plate to single grid or push ull grids may be used. Electrically it is con- ected in the grid of the *rf* power amplifier as own in fig. 5. No noticeable effect of modu- tion distortion was noted in spite of the fact at it is not a good idea to grid modulate a age which obtains its bias by grid-leak meth- ds.

In order to use crystal control on the trans- itter it will be necessary to remove C-19, C-21 d the oscillator coil L-5. It is not necessary to hysically remove L-5, although we will have mount our crystal socket somewhere. We ose to mount it where C-19 and C-20 were reviously located. The socket is a dual crystal cket made by Cinch-Jones under part num- er 2K4. The oscillator is wired in as in fig. 6. asically it is a Pierce type, with a tank circuit ned to the second harmonic in the plate cir- uit. The screen of the tube is actually the plate f the oscillator. By using a dual crystal socket is possible to use two crystals and make full se of the two channel feature of the equip- ent. Figure 6 shows the new oscillator wiring.

Tuning the Equipment

The receiver should be tuned first. Insert the roper crystals into the desired channels and t SW-1 and SW-2 to the OFF position. Set e OFF-ALIGN switch to the ALIGN posi- on and turn the equipment on, making sure at the volume control is full on. When the robe is not in use it should be in its Fahne- ock clip, but now insert it into pin 1 of the etering socket. Set the panel meter switch to HECK. Adjust the receiver oscillator trimmer make a maximum reading on the meter. ake sure that you are adjusting the one cor- sponding to the channel that you are setting. ou should be able to get a reading of about divisions. Now put the probe into the pin umber 2. Adjust the mixer grid control for maximum reading on the meter and then eak the *rf* grid control for maximum noise ith the probe in pin 3 of the metering socket. aximum noise in the loudspeaker of the equipment or in the headset should now be obtained by again peaking the mixer and *rf* controls. No attempt should be made to try to get maximum output by adjusting the *if* amplifiers unless you have suitable alignment equipment (see CQ May 1959). If you have a station to listen to, or if you have a suitable signal generator, grid dipper or other signal source, you may tune up on that, trying to obtain maximum signal output. A reduction in noise and improvement in signal may also be obtained on some sets by a careful re-adjustment of the receiver oscillator tuning.

Tuning the transmitter is a little more tricky. It involves the use of a microphone with a press to talk button (carbon microphone) and only when the adjustment is actually going to be made should the button be depressed so as not to overload any tubes with excess current. With the probe in pin 6 press the mike button and check the transmit crystal oscillator for voltage. This should be several divisions on the meter. Now, insert the probe into pin 5 of the metering socket and again press the mike button long enough to adjust the BUFFER- GRID for minimum meter dip. Now replace the meter probe into its holder and set the OFF-ALIGN switch to OFF. The remaining adjustments are made using the panel switch. Set the SW-1 switch to ON and when ready to make the adjustment, press the mike switch and tune the P.A. GRID for minimum, releasing the button as soon as the adjustment is made. Next, set SW-2 to ON and set the meter switch to OPER. Press the mike switch when you are ready to adjust the P.A. PLATE and do it quickly. The P.A. PLATE should be adjusted to minimum.

You should not have any trouble with the equipment, since the conversion is fairly straight forward, however, several models of the equipment were made, some with and some without the metering feature. In the event that your BC-659 is without the meter, you can always make use of the metering techniques used on standard transmitters, and of the alignment techniques described in CQ, May 1959. It is advisable to load up the final stage (P.A. PLATE) by means of a field strength indicator of some type, since that way would allow you to verify your actual transmitter operation. A grid dip oscillator with the B-plus turned off would serve quite well in this application.

Handbook Requests

The handbook requests are coming in thick and fast and strangely enough, many of the requests could be answered by looking back in CQ conversions. The eleven year index is still available to readers. It lists all articles in CQ up to and including 1955. Most of the mail is about the ART-13 and where to get conversion information. This has been covered in several issues, specifically November '46, February and December 1947, and again in Janu-

[*Continued on page 94*]

URBAN Le JEUNE Jr., W2DEC
416 North 15 St., Kenilworth, N.J.

DX DX DX DX DX DX DX DX

The WAZ and WPX records were received just a few days before the column deadline date, and I couldn't quite get the WPX box score into shape in time. It will definitely be in next month's column. The following WAZ and WPX numbers have been assigned to those who have been listed without numbers:

CW/Phone WAZ

894	K2GMO	912	G3IMV	929	K2UPD
895	F9IL	913	PA0LOU	930	CN8DJ
896	F3CB	914	PY3QX	931	OD5LX
897	K2FC	915	OH3RS	932	W0FNN
898	OH3TH	916	W1OTX	933	K2OEA
899	G3HFJ	917	OE5JK	934	W0MLY
900	W6GMC	918	PA0PN	935	W2KED
901	DU7SV	919	F9RS	936	K4BVQ
902	VE8PB	920	DL7CW	937	W2BOK
903	G3JHZ	921	KL7PI	938	W8QFR
904	ON4MN	922	W0FUH	939	W6WTH
905	W2TXB	923	W2HO	940	W2AEB
906	VK7CH	924	W9RKP	941	OH5RH
907	W3BQA	925	W3LMM	942	W1AZY
908	DL3LL	926	W2FBS	943	K6RWO
909	W8DLZ	927	W2RSR	944	VE7SB
910	W6CZQ	928	W2FXN	945	W7AUS
911	OH6OA				

All Phone WAZ

26	W2BXA	27	W2DEC

CW WPX

31	W2PTD	32	K4JVE

SSB WPX

3	W8YBZ

The following certificates were issued this month:

WAZ

946	ZL3DX	Wyn H. McGee
947	SM5ARR	Olle Lindquist
948	K0DMY	James W. Atkins
949	VE5TK	R. H. Smith
950	G3ESY	Peter W. F. Jones
951	DJ3JZ	Eberhard Ludwig
952	W6WJM	Art McDole
953	SM7TQ	Gustav Georg Johansson
954	KH6BTX	Gladys T. Sickle
955	KH6BLX	Clyde E. Stickle
956	SM2BCS	Eskil Gustafsson
957	KH6AUJ	Dotty James
958	W3WU	M. W. Downs
959	DL1MF	Georg Kirner
960	LA7Z	Jan Arvesen
961	LA8LF	Anders M. Thorrud
962	SM5CXF	Bo Hellstrom
963	JA9AA	Kiichi Emma
964	G3CQE	Bill Brennan
965	HA5BI	Istvan Biro
966	XZ2TH	Tun Hai U
967	W8KZT	Len Clift
968	W9WFS	Howard V. Lindh
969	G3KKP	Jack Burgess
970	UA1CB	Michael S. Majburoff
971	ZL1RD	Thomas Keith Stewart
972	G3DQC	J. L. Salter
973	VE2YU	E. A. Welling
974	JA3DY	Masahiko Hasimoto
975	VE3BWY	Rev. H. A. M. Whyte
976	W2SHZ	H. E. Eddy
977	JA2AT	Hitoshi Tsuchiya
978	W0ZYB	Cecil E. Brittenham
979	W0CDP	H. A. Miller
980	OH2MB	Antti Silander

CW WPX

33	DL7CS	Bruno Stangnowski
34	W3LMA	Edward Dillmeier
35	W6YY	John Knight
36	UA9DN	Vladimir Semenov
37	W5DA	J. L. Young, Jr.
38	W3BCY	John A. Springer
39	DJ3BB	Herbert Machlitt
40	PA0VO	J. van Oord
41	SM5BCE	Erik Soderberg
42	VK6WT	David Couch
43	VE3BWY	Rev. H. A. M. Whyte

SSB WPX

4	W0CVU	Charles W. Boegel, Jr.
5	W2TP	H. G. Mustermann

WAZ and WPX applications which had t be temporarily rejected have been running ver high this month. WAZ rejections have bee over one third. Most of these errors are du to misunderstanding. The Russian zones are th chief culprits with the WAZ applications. S let's take a look at them.

Zone 17 includes all UH8, UI8, UJ8, UL7 and UM8. The following provinces are also i Zone 17: Chelyabinsk, Sverdlovsk, Molotov, Tyumen, Omsk, and Kurgan. All are UA9's.

Zone 18 includes the following UA9 prov- ices: Novosibirsk, Tomsk, Kemerove, and Al- i. The following are UA0 provinces: Krasno- arsk, Buryat-Mongolia, Irkutsk, and Chita.

Zone 19 includes the following provinces: All A0, Khabarovsk, Amur, Primorsky, and Ya- utsk. The northern half (above the 50th paral- l) of Sakhalin Island is also Zone 19.

The following will serve as a guide: Zone 17 -UA9A, UA9KA, UA9C, UA9D, UA9KC, A9KD, UA9F, UA9KE, UA9J, UA9KJ, A9M, UA9KM, UA9Q and UA9KQ.

Zone 18—UA9H, UA9KH, UA9O, UA9KO, A9V, UA9KU, UA9Y, UA9KY, UA0A, A0B, UA0C, UA0O, UA0P, UA0KO, A0S, UA0KS, UA0U, UA0V, andUA0KU.

Zone 19—UA0KC, UA0F, UA0G, A0KF, UA0KG, UA0J, UA0KJ, UA0L, A0KK, UA0R, and UA0KQ.

Please note that UA9S, UA9KS, UA9W, d UA9KW are located in Bashkir Province, hich is Zone 16.

Another confusing zone is Zone 2. Only ose VO's which are in Labrador are Zone 2 d only those VE8's in Northeast and North entral Canada are in Zone 2.

If you are in doubt, send several cards.

For WPX, ALL cards must be submitted rectly to me. Postage for the return of the rds must also be included. WPX application rms and WAZ zone maps are available from e upon receipt of a self-addressed, stamped velope. WPX Record Books are available r $.15 in stamps or coin. WPX is available ly on an all phone or all CW basis. There is O CW/Phone WPX. The Phone WAZ is sued only for all two-way phone QSO's and a atement must be included to the effect that l QSO's were two-way phone QSO's.

DX-Peditions

The main news this month seems to be expe- tions or lack of expeditions.

XE4 SOCORRO ISLAND—XE1CV's trip to corro was cancelled at the last minute when e Mexican Navy informed him he would not allowed to land due to maneuvers in the ea. All the food, gas, etc., had already been rchased and put aboard the boat. He will / again in the near future if landing permis- on can be obtained.

DANNY—True to promise, Danny finished s rounds of the new VP2 countries, operating VP2GDW from Granada. He is going to P4, Trinidad, to look at a new boat. The at is quite a bit larger than the last one, and anny will be sailing with a crew of at least o from now on, so that no undue chances ll have to be taken and insurance can be ob- ned. While speaking to Danny on the air, appeared to be in good spirits and quite de- mined to carry on with the expedition. If new boat is obtained, Hallicrafters will re- ace the gear that was destroyed and give me financial aid.

TI9-COCOS ISLAND and others—By the time you read this, Martin, VE3MR, and Humberto, TI2HP, should have completed their TI9 expedition, but Martin will be going to several places in South America that have had no SSB activity.

ET2—The proposed trip to FL8 by the ET2US gang was called off when transportation could not be arranged. (Tnx W2HQL)

KS4-SARANA BANK—W4KVX, W3PZW, and W9EVI made it to KS4 and did a bang-up job on all bands, CW, AM fone, and SSB. They had some trouble finding the island but made it while everyone was holding his breath. For a while it looked as though it was going to have as much suspense as the FO8AJ expedition. QSL for CW QSO's to W4KVX, fone QSO's via W9JUV.

W8OLF TRIP. W8OLF will be starting his operation world wide very soon. The trip will last 45 days and will go to W2-VO-CT2-CN8-GM- DL- F-I1-5A- SV0-TA-OD5-HZ-HS-DU-BV-HL-KA-KR-KW6 and KH6. Bill, W2SKE, will take in part of the trip. Operation will be on CW and SSB on twenty meters.

FP8-ST. PIERRE—Tom, K2JGG, will be returning to FP8 again this year during the first two weeks in July. He will use his old call, FP8AB. His home station SSB gear is very heavy and he'd like to borrow or rent a small SSB rig. Can anyone help Tommy out?

GD-ISLE OF MAN—G3CQE, G3IOR, G3LDI, and G3MPN are going to the Isle of Man for a week. They will use the call GB3GD. This is the first GB3 call issued and will be a good one for WPX hunters. Equipment will include a KWM-1 and a Mosley Tribander. Stateside QSL's via K9ELT, others via G3CQE. (Tnx K9ELT)

3A2-MONACO—Bob, ON4QX ex ON4QX/LUX, ON4QX/OE, ex DJ0BG will be operating as 3A2CZ for two weeks this year. He will operate on 14.020, 14.050, 14.090, and 14.200 fone. QSL via Box 331, Antwerp, Belgium, c/o ONL744. However, he will not QSL to stations that owe ON4QX a card. If Bob is missing your card, you'd better hurry up. . . .

CR10-PORTUGUESE TIMOR—The expedition mentioned last month is on and two VK's have obtained the license to operate there. I'm not sure of the exact date.

PELAGICS ISLANDS—IT1ZGY will operate from this spot for three days. He is trying to have a special call assigned, either IP1AA or IT0AA. If this permission is not obtained, the call IT1ZGY/IP will be used. This one is separate for WAE, and one never knows. QRG will be 14.100 CW.

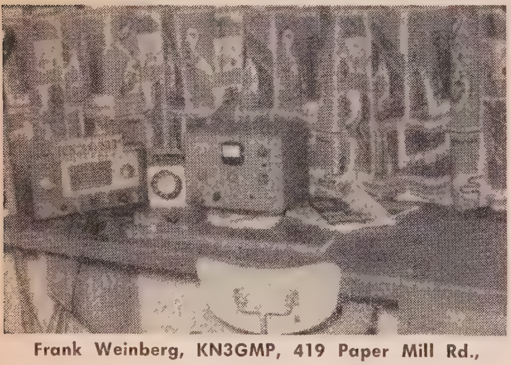
VE1-PRINCE EDWARD ISLAND—Do you need P. E. I. for WAVE? W1QMS will be active from there from July 6 thru 15th on 15 and 20 meter phone, AM only. Call will be W1QMS/VE1. (Tnx W1QMS) As I mentioned previously, there is quite a bit of expedition

[*Continued on page 100*]

by **DONALD L. STONER, W6TN**
P.O. Box 137, Ontario, Cali

Novice

Carl Haywood, KN7EAB, Claypool, Arizona, has some pretty impressive wall paper. He still needs skeds with the 4th call area and will sked anyone needing Arizona. WAS total is 24 with 22 and VE3DAN confirmed.



Frank Weinberg, KN3GMP, 419 Paper Mill Rd., Newark, Delaware, operates from this shack with his Knight 50 Watter and S-53. He would like to join a radio club and wonders if there is any in his area.

It occurred to me, the other day, that althoug
I have been warning my readers about har
monics, I have never explained what happen
if they are cited. A Novice friend of mine re
ceived one recently (for out of the band opera
tion—more about this later) and I borrowe
it until he recovered.

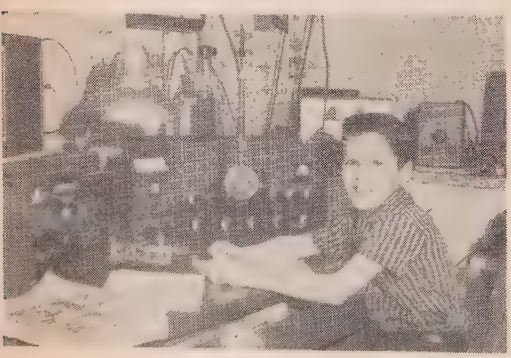
If you receive an envelope from the FC
(and you are not expecting a new license)
chances are you have troubles! In additio
to a very complete explanation of the viola
tion conditions, the citation will read some
thing like this:

"The facts set forth below indicate that yo
have violated the requirements of law an
treaty. Response to this Notice must be in ac
cordance with the procedures set forth fo
answering Official Notices of Violation in Sec
tion 1.61 of the Commission's Rules Relatin
to Practice and Procedure."

"Briefly, within 10 days from the receipt o
this Notice, a written answer in DUPLICAT
shall be addressed to 'Federal Communication
Commission' and sent to the address above. D
NOT address your reply to an individual. Th
answer shall be complete in itself, shall not b
abbreviated by reference to other Notices, sha
contain a full explanation of the incident in
volved, and shall set forth the action taken t
prevent a continuation of recurrence thereof.
You must admit that answering such a citatio
is a lot of bother (in addition to having a blac
mark on your record) when by comparison
is so simple to have a friend check your signa
frequency and its harmonics.

My Novice friend is back in the good grace
of the FCC now, but he had troubles for
while. Ironically, the citation was for his las
contact as a Novice! He received his Gener
Class ticket two days before the citation ar
rived!

It seems he purchased a few 40 meter Novic
rocks from a "famous" surplus crystal com
pany. One of the crystals was marked 715
kc, just inside of the low end of the band. *Ac
tually* the crystal oscillated on 7149.96 *kc* a
evidenced by the measurement listed on the c



Jimmy Kalasky, K8LDD, 738 Truesdale Rd., Youngstown 11, Ohio is only nine years old but is already an ole timer, having graduated from the Novice ranks along with the OM-K8LDC. His younger brothers (5 and 6) already are showing an interest in ham radio! Jimmy built the DX-40, shown behind him, when he was a Novice!

ion. Moral of the story: don't believe the
stal frequency, have someone check your
nsmitted frequency!

DX News

Ken Bale, W7VCB, Letournea, Liberia, West
rica, writes to say that he will be on the
okout for Novices. No call assigned at this
iting. QSL cards go to W7PHO with
A.S.E.

The following stations were heard calling
ovices. Did you snag them? GM3FRI called
V2BWV, SM5UU called KN3EVR, and
HRA called KN1IVQ.

Tima Popovic, YU1RS-357, reports receiving
e following stations in Banat Novo Selo, Yu-
slavia: March 8, 1630-2130:

KN1GCX, GYT, HEF, HEY, HRM, HTQ, HZM, HZR,
V, IFJ, IID, IKN, IVP, IVQ, JCJ, JDP, JGX, JVM,
A2AFX, APZ, AXN, BIM, BLK, BLP, BLZ, BPU,
V, CAN, CAW, CBB, CJC, COW, CPT, DEF, DFJ,
L, EAL, EAQ, KN2OJJ, OXO, RDU, RIS, TZR,
IU, KN3BRK, DLI, DPT, EGE, EHN, EPJ, EVR,
C, GBY, GED, GFF, GIQ, GVK, GWC, HBZ, HFF,
W, HGG, HJC, HPG, HPU, KN4ACI, ACJ, AWM,
M, DPL, DRF, DZJ, EFZ, FGZ, GEO, UMT, VAH,
G, VUZ, YGS, YRH, YSQ, YWZ, YYC, ZLO, ZYS,
5RIP, SGD, STA, TFH, TOB, WV6AIM, KN7GGY,
8DRR, DWK, JRL, KTZ, LFY, LQA, LVB, LVH,
IM, MPR, MYF, NBP, NDI, NGR, NWK, ODJ,
9LBB, LSB, MGC, OAZ, ODJ, OSK, OUY, PGA,
U, PYL, QJP, QJV, QXY, KN0GRA, HXV, QMY,
V, RFE, SKK, SVW. March 15, 1915-2220 GMT:
1GOQ, HFL, HHN, HRL, HZQ, IAL, IBJ, IKD, IRI,
Y, IWD, JAI, JIR, KAV, WV2AMM, APQ, AXN,
R, BQO, CHK, CII, CRG, KN2SMC, SNA, SOA, SQH,
3EGR, GIA GIT, GOC/3, GSA, GXW, HGN, HJO,
G, HLU, HLX, KN4AVR, BBN, CRY, DCI, DKU,
K, ESN, FHZ, VCN, VDK, VTJ, YCL, YMU, YOA,
G, YZR ZEO, ZZI, KN5RHZ, SWR, TMX, KN8KDL,
K, LDF, LQW, MJL, MUU, MWU, NDV, NHC,
I, OJB, KN9LVG, LXW, MKP, MSY, MTK, MYA,
P, PMP, QFB, QKZ, QVH, KN0PDE, PKK, REV,
N, RXT, SBX, SKK.

The following stations were reported as re-
ived in Dhahran, Saudi Arabia at HZ1AB.
te March 12, 2000-2200 GMT: KN1HBM,
L, JVB, KN2UVU, WV2BDK, DRW,
N3DTA, GIT, KN4DLJ, KN8KTZ, KN9-
WK.

Rolf Stromberg, Box 514, Vindeln, Sweden,
ys he will have his SM6 license in May and
ll be looking for Novices on the 15 meter
nd. Rolf reports receiving the following sta-
ns during the first part of 1959 on 15 meters:
n 18, 1700-1900 GMT:

/2BLK, KN3GLW, GWC. Jan 21, 1600-1855 GMT:
1GMS, IBL, GYT, KN2TEI, MMU, OMQ, WV2AUI/2
G, AUH, KN3CWC, HEO, HNE, GIT, GIQ, GJH,
4DLJ, ZNK, KN8KMB, KTZ. Feb. 24, 2100-2215 GMT:
1GXC, HZQ, WV2AED, AXR, DTV, EAL, KN3DIE,
O, EXM, GIT, GRL, KN4VOX, VTJ, YAG, YFB,
8JWS, KCC/8, KRL, LGX, MTC, NNG. Feb. 27, 1200-
5 GMT: KN1GYK, HSM, HTV, IEO, III, IKN, IVS,
A, JIU, KN2RGF, TZM, KN4AWM, AVI, VHT, VTJ,
R, ZVC, KN8LJM, Feb. 28, 1230-1600 GMT:
/2AWR, BFF, KN8KIX, KTZ, MXZ, KN4YPZ, March
1400-1535 GMT: KN1HJN, HVU, IIK, IOG, IQM, IYS,
U, JDP, KN2RBH, SIQ, UVB, WV2AAI, ARJ, AXG,
R, BSQ, CJO, EAL, KN3EGH, ESS, HPS, KN4AWM,
S, DXD, YWZ, YXC, YYZR, ZEQ, KN9QRA,
0PDE, PIF, PPO, PPX, RJM.

Rolf says that he will supply QSL's to confirm reception upon receipt of your QSL card.

Help Wanted

Jack Olson, K9PZZ, advises us that the hams at Valparaiso Tech, Valparaiso, Ind. are conducting code and theory classes. Contact Jack, K8ASX, or K9JDF.

John Champa, KN8OCL, 1542 Wyandotte Rd., Columbus 12, Ohio, writes to say that the RTCO Amateur Radio Club is anxious to help prospective Novices get their license. They teach both code and theory. Interested persons can contact John or phone him at HU 8-1698.

The following persons have expressed a desire to obtain a ham license:

W2—Joseph Kaplan, 6 Southridge Drive, Glen Cove, N. Y.

W5—Walter Martin, Georgetown, Texas.

W8—Bill Klima, 2984 E. 116 St., Cleveland 20, Ohio, Telephone GA 1-2385

W9—Tom Tollefson, 308 Shabbona, Park Forest, Illinois. Phone PI 8-3123.

Letters

Mike Lynch, KN5SEK, 5102 Tawney St., Amarillo, Texas, has taken his conditional and should be a General by now. He writes to say that he contacted an ELWH/MM, a Liberian ship operating off the coast of Saudi Arabia. Mike has also worked my old friend Volta, DU7SV, who is always on the lookout for Novices.

Rolf Stromberg, Box 514, Vindel, Sweden, will soon have his ham license, but would like to correspond with Novices, particularly on the West Coast. He enjoys music, travel, and learning about foreign countries.

Paul Botluk, KN3EBH, Rising Sun, Maryland, would like skeds with the west and midwest on 80 and 40 meters. He uses a DX-35 and NC-125 and operates between 0400 and 0530 EST. Paul will be glad to sked anyone needing MD.

Steven Starkes, WV2DXV, 1024 E. 12th St., Brooklyn, 30, N. Y. is a brand new Novice at age 16. He uses a DB-23 preselector in front of his NC-125 and plans on putting up a Hy-Gain 14AV vertical.

Sgt. Calvin J. Sprayberry 1399639, Hq. Btry. 12 Marines, 3rd Marine Div. FMF, FPO, San Francisco, Calif. is currently "vacationing" on Okinawa and would like to join a SWL club. He reports hearing many Hams in KR6 land.

Bill Troop, 435 Patten St., Sonoma, Calif., would like to know if there is any code practice sessions on the air, from the West Coast. He would appreciate learning the frequency, date, and time.

Randy Seybold, KN5TTE, 2041 Claremont, Houston 19, Texas, has been on the air for only a month but has racked up 12 states plus Chile. Randy uses a Johnson Adventurer along

[*Continued on page 104*]

by DONALD L. STONER, W6TNS
P.O. Box 137, Ontario, Calif.

semiconductors

Ordinarily, batteries would be somewhat out of place in a column devoted to semiconductors. But then, how many transistors are powered from battery supplies? Certainly there are a lot less operating from *dc* "power-packs".

Experimenters will be very interested in a new minature nickel-cadmium rechargable battery. These cells pack a terrific punch in a very small package and at low cost. Naturally they are more expensive initially, but after 20 recharges (or so), they will pay for themselves. The rest of the power is "for free", so to speak.

Nickel-cadmium batteries were invented in France by the Societe des Accumulateurs Fixes et de Traction (SAFT—Paris). The CG Electronics Corporation of Albuquerque, N. M., is the exclusive licensee for their manufacture in this country. The following cells are currenty available: VO-100, VO-180, VO-250, VO-500, VO-800, and VO-1750 (the number indicates the milliampere-hour rating). The battery nominal is 1.2 volts as shown in the typical discharge curve, fig. 1. Note that there is a severe reduction in voltage when overloaded, and yet they continue to deliver power for an amazing length of time.

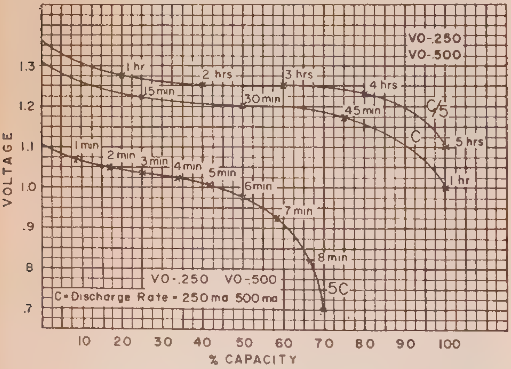


Fig. 1—A typical discharge curve for the VO series of batteries.

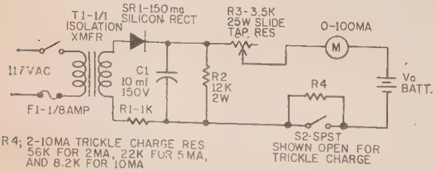

T1-1/1 ISOLATION XMFR
SR1-150ma SILICON RECT
R3-3.5K 25W SLIDE TAP RES
0-100MA
M
117VAC
C1 10 mf 150V
R2 12K 2W
R4
Vo BATT.
F1-1/8AMP
R1-1K
S2-SPST SHOWN OPEN FOR TRICKLE CHARGE
R4; 2-10MA TRICKLE CHARGE RES 56K FOR 2MA, 22K FOR 5MA, AND 8.2K FOR 10MA

Fig. 2—Charger suitable for Nickel-Cadmium batteries.

Recharging can be accomplished in excess of 500 times using the circuit shown in fig. 2. The recommended charging current can be applied for periods in excess of 90 days and can be trickle charged indefinitely. Typical charging currents vary from 8 *ma* for the VO-100 to 150 *ma* for the VO-1750.

Diameters run from .88″ to 2.0″ for the VO-100 and VO-1750 respectively. The weight ranges from .25 ounces to 3.5 ounces for these two cells. The other sizes fall between these two limits. Prices for the nickel-cadmium batteries are quite reasonable, for example, the VO-100 is $1.75 and the VO-800 is $4.95. You can obtain data sheets and literature on these batteries by writing CG Electronics Corporation, 15000 Central, S.E., Albuquerque, New Mexico.

QRP Corner

It appears that it isn't always power that makes the QSO. It may seem strange, but that tiny drop of radiation sent on its way by the transistors somehow can be very readable many thousands of miles away.

One major problem for many hams operating transistorized transmitters is the lack of others willing to listen. I have found it sometimes takes a fair knowledge and ability to tune a receiver if the low-power signal is to be read.

We are suggesting 29.2 *mc* as a monitoring frequency, to help those who want to get re-ts with their low power rigs. You TR ex- rimenters: let's have your suggestions for ier monitoring frequencies or schedules.

The QRP section is for you who are on the with semiconductors. Tell us what's new that it can be passed on. With your help iers will make better QSO's with their tran- tors and low power. Drop me a line, Richard Griffith, W7MPQ, P.O. Box 925, Tucson, izona.

Literature

If you are interested in diode rectifiers, don't l to buy a copy of International Rectifier rporations' *Rectifier Engineering Handbook*. available for $1.50 from International Rec- er Corp., El Segundo, California.

Semiconductor News

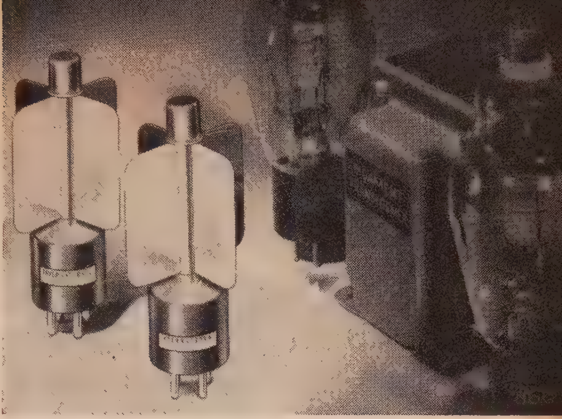
General Electric has reduced the prices on silicon controlled rectifiers. The reduction ounts from six to forty-four percent. Ac- erated life tests on the 45 volt silicon high- quency transistors indicates they far exceed litary specks. This transistor is the one using fixed-bed mounting technique on a ceramic c, types 2N332 through 2N338. GE has just announced a new rectifier for PIV's to 1000. The 1N561 is a "top-hat" type, ile the 1N563 is a similar unit in a stud- unt case. Bulletins ECG-398 and 399 de- ibe them. Bulletin ECG-388 recaps the en- GE line of rectifiers.

The big news from International Rectifier rp. this month is their silicon 866 rectifiers. ted at 6,400 PIV, these units will provide output currents of 250 *ma* at 75° ambient iperature. They provide a 2/3 reduction in ce and weigh less than 1/16 of equivalent e circuitry (see photo). Price—*about* 20 bux. od by—866's! Write for bulletin SR-149A.

High efficiency solar silicon battery mod- s are also available from International. They vide the same power output, watt for watt, dry cell and mercury cell units. The output tage of the solar module is 1.5 volts *dc* 55°C (typical operating) temperature in di- t sunlight). They provide 35 *ma* in direct light. Price—$24.00 each. Bulletin SR-276 cribes them in detail. Write International tifier Corp., El Segundo, Calif.

t's bad enough with tubes, but now they starting it with transistors. RCA showed nulti-unit transistor at the IRE convention, ch contains a triode transistor and a diode ector. Also shown was their new five trans- r auto radio, which uses no tubes! The re- ver can produce one watt of audio for a microvolt *rf* signal input. The old faithful 301 is used in a single-ended class A cir- .

RCA has gone into the Micromodule busi- s in a big way. They are producing pack- d circuits, including dividers, gates, ampli- s, limiters, discriminators (on 4.3 *mc*), io amplifiers, *rf* amplifiers (50 *mc*) etc. In fact, just about every circuit you need for a vest pocket computer. Prices run from $46 to $247 per! I'll wait! Silicon power transistors are a new item from RCA. Types 2N1067, 1068, 1069, and 1070 lead the line and are intended for switching, *dc* amplifiers, Class A or B amplifiers, and servo systems. New germanium types 2N456, 457, 561 and 1014 are designed for power converter applications and will deliver 106 watts with an efficiency of 97.4% at 28 volts input!



Space comparison between the new silicon 866's and the obsolete tubes they replace. With reasonable care these new rectifiers should last indefinitely!

The silicon controlled rectifier acts like both a power transistor and a rectifier. Like a rectifier it changes alternating current to direct current and like a transistor it controls the amount of current fed into a circuit.

Texas Instruments announced, at the IRE show, a new line of 10 to 25 ampere germanium power transistors, available with collector ratings from 40 to 80 volts. Also shown was their new 30 and 50 amp. stud rectifiers, with PIV's between 50 and 600 volts!

Triad Transformer Corporation, 4055 Redwood Avenue, Venice, California, has expanded their transistor power converter transformer line to include 21 new epoxy molded toroidal types, including 6, 12, 28 volt and 60 cycle units. If interested, drop them a line and get their new brochure.

That does 'er for another month. If you have any news of a QRP nature, be sure ot drop a line to Dick. If you have any new and interesting circuits, be sure to send them along to me.

73, Don, W6TNS

PROPAGATION

George Jacobs, W3ASK
607 Beacon Road, Silver Spring, Md.

June's Highlights

June is a month of typical summer-time radio propagation conditions. Night-time usable frequencies to most parts of the world are *higher* than at any other time of the year, with the *20 meter* band optimum for long distance propagation during the hours of darkness, and until a few hours after daylight. The *15 meter* band is expected to be best during the hours of daylight, peaking in the late afternoon and early evening. *Ten meters* is forecast to open fairly frequently on north-south circuits, but only occasionally on east-west paths. Atmospheric noise, or static is most intense during June and the summer months and will be most noticeable on *40, 80, and 160 meters*. Sporadic-E propagation increases considerably during June, and this is expected to result in short-skip openings for at least 50% of the time on *10 meters,* and on a number of days on *6 meters.*

Project Argus

On March 26th the President's Science Advisory Committee, and the National Academy of Sciences jointly announced the remarkable results of Project Argus, science's first successful attempt at producing a widespread man-made ionized region in the earth's upper atmosphere.

As part of Project Argus, three atomic blasts were set off secretly, above the earth's atmosphere, on August 27, 30 and September 6, 1958. Rocket-launched from U.S. Navy ships located in the South Atlantic, about mid-way between Cape Horn and the Cape of Good Hope, the atomic blasts injected electronic radiation into the earth's upper atmosphere at a reported level of approximately 300 miles. The initial burst of electrons, trapped by the ever-present magnetic field surrounding the earth, was carried along the lines of magnetic force in such a manner as to create, within an hour's time, a shell, or "skin" of radiation almost completely girdling the earth at high altitude. Elaborate preparations were made to observe the effects of the Argus firings from the ground, from airplanes and rockets, and from an earth satellite (Explorer IV). The effects of Argus were readily observable from the ground b recorded changes in the earth's magnetic fiel and in radio soundings of the ionospher Bright auroral glows appeared overhead at th point of firing, and were also reported at th other end of the magnetic lines near the Azor Islands in the North Atlantic, and near Samo in the South Pacific. Science's first attempt forming an artificial ionosphere appears to hav been successful, and the geophysical effects produced by Project Argus persisted for severa days.

With the whole world now being used a one vast laboratory, the continued harnessin and the eventual control of the ionization i the earth's upper atmosphere appears to be inevitable in the years ahead. From such fasc nating developments will no doubt emerg many new techniques for more reliable an more efficient radio communications than now imaginable.

Sunspot Cycle

The sunspot cycle continues its slow declin from maximum. The Zurich Observatory r ports a monthly mean sunspot number of 18 for March, 1959. This results in a 12-mont running smoothed sunspot number of 183 ce tered on September, 1958. This month's C forecasts are based on a predicted smoothe number of 150 centered on June, 1959.

As part of my Master's Degree thesis at t University of Maryland I have prepared an a pendix containing a complete list of all month mean, and 12-month smoothed sunspot nu bers recorded since 1750. As far as I am awa this is the first up-to-date table of this sort pu lished in the past 20 years. A limited numb of copies of this appendix, containing mo than 20 pages, and including a graph of t present cycle, and sunspot predictions for t next five years, are available directly from t author at *one dollar* a copy, postpaid.

Expanded Forecast

Since June typifies summer-time propagati conidtions, this month's *CQ Propagation Cha* contain an analysis of nearly twice as many ci cuits as usual.

73, George, W3AS

Last Minute Report

Short wave propagation conditions are generally stable during the month of June and significant disturbances are forecast. Exceptionally good conditions are likely to occur tween June 12-18.

MONTH: JUNE, 1959

ALL TIMES IN E. S. T.

ERN USA TO:

	*6/10 Meters	15 Meters	20 Meters	40/80 ** Meters
ern Europe	10A-12N (1) 12N-3P (2) 3P-5P (1)	6A-1P (2) 1P-7P (4) 7P-11P (2) 11P-6A (1)	5A-1P (1) 1P-4P (3) 4P-10P (4) 10P-5A (3)	8P-11P (3) 11P-1A (2) 9P-12M (2)**
inavia & Europe	10A-3P (1)	7A-1P (1) 1P-5P (2) 5P-8P (3) 8P10P (1)	1P-5P (1) 5P-11P (3) 11P-7A (1)	9P-1A (1) 9P-11P (1)**
rn erranean	11A-3P (1)	5A-11A (1) 11A-3P (2) 3P-7P (3) 7P-10P (2) 10P-1A (1)	12N-4P (1) 4P-11P (3) 11P-3A (2) 3A-6A (1)	8P-11P (2) 9P-10P (1)**
ern Europe th Africa	10A-12N (1) 12N-3P (2) 3P-6P (1)	5A-8A (2) 8A-12N (1) 12N-8P (4) 8P-10P (3) 10P-5A (2)	1P-5P (2) 5P-1A (4) 1A-7A (2)	8P-1A (2) 9P-11P (1)**
& Central	9A-12N (1) 12N-6P (2) 6P-8P (1)	5A-11A (2) 11A-2P (3) 2P-8P (4) 8P-11P (2) 11P-5A (1)	1P-5P (2) 5P-1A (4) 1A-7A (2)	8P-2A (2) 9P-12M (1)**
Africa	3P-5P (1) 5P-8P (2)	9A-12N (1) 12N-2P (2) 2P-7P (3) 7P-11P (2)	2P-6P (2) 6P-10P (3) 10P-1A (2)	7P-9P (1)
Africa	8A-11A (2) 11A-3P (3) 3P-7P (2)	1A-5A (2) 5A-11A (1) 11A-7P (3) 7P-10P (2)	1P-5P (2) 5P-9P (3) 9P-1A (2) 1A-5A (3)	7P-2A (1)
hern America	12N-6P (1)* 7A-11A (3) 11A-5P (4) 5P-7P (3) 7P-10P (2)	7A-5P (4) 5P-7P (5) 7P-1A (4) 1A-7A (3)	9A-4P (3) 4P-9A (5)	7P-6A (3) 11P-5A (2)**
ntina, il & CHile	3P-7P (1)* 7A-11A (2) 11A-6P (3) 6P-9P (2) 9P-12M (1)	5A-9A (3) 9A-2P (2) 2P-11P (4) 11P-5A (2)	3P-5P (2) 5P-2A (4) 2A-8A (3)	8P-1A (2) 1A-6A (3) 1A-5A (1)**
al Asia	Nil	9A-3P (1) 3P-6P (2) 6P-10P (1)	6A-9A (2) 9A-11A (1) 5P-9P (1) 9P-11P (2) 11P-1A (1)	Nil
& Far	Nil	1P-3P (1) 3P-7P (2) 7P-9P (1) 8A-10A (1)	11P-2A (2) 2A-7A (1) 7A-10A (2) 10A-6P (1)	Nil
ya & South- Asia	Nil	12N-2P (1) 2P-5P (2) 5P-7P (1) 6A-8A (1)	6A-9A (2) 9A-2P (1) 2P-4P (2) 11P-1A (1)	Nil
a	6P-11P (1)	8A-10A (1) 10A-6P (2) 6P-11P (4) 11P-1A (2) 1A-3A (1)	5P-10P (2) 10P-3A (4) 3A-7A (3) 7A-9A (4) 9A-12N (2)	12M-7A (3) 1A-6A (1)**
& Pacific ds	Nil	5P-7P (1) 7P-11P (2) 11P-1A (1)	11P-2A (1) 6A-9A (2) 9A-12N (1)	Nil
ppines & Indies	Nil	11A-2P (1) 2P-6P (2) 6P-8P (1)	6A-9A (2) 9A-2P (1) 11P-1A (1)	Nil
alasia	6P-8P (1) 8P-10P (2) 10P-11P (1)	5P-9P (1) 9P-1A (3) 1A-7A (1) 7A-10A (2)	6A-9A (3) 9A-12N (2) 12N-12M (1) 12M-3A (3) 3A-6A (2)	1A-6A (2) 2A-5A (1)**

ALL TIMES IN C. S. T.

CENTRAL USA TO:

	*6/10 Meters	15 Meters	20 Meters	40/80** Meters
Western Europe	11A-1P (1) 1P-3P (2) 3P-5P (1)	6A-12N (1) 12N-2P (3) 2P-6P (4) 6P-10P (2) 10P-6A (1)	12N-2P (1) 2P-4P (2) 4P-11P (4) 11P-3A (2)	8P-11P (2) 9P-10P (1)**
Northern & Central Europe	2P-5P (1)	7A-10A (1) 10A-2P (2) 2P-6P (3) 6P-10P (1)	1P-4P (1) 4P-11P (3) 11P-3A (1)	8P-11P (1)
Southern Europe & North Africa	9A-11A (1) 11A-3P (2) 3P-5P (1)	5A-11A (1) 11A-7P (3) 7P-10P (2) 10P-5A (1)	1P-4P (2) 4P-9P (4) 9P-1A (3) 1A-3A (2)	8P-12M (2) 9P-10P (1)**
Central & South Africa	8A-12N (1) 12N-4P (3) 4P-7P (2)	12M-3A (2) 3A-12N (1) 12N-6P (3) 6P-8P (2) 8P-12M (1)	1P-4P (2) 4P-9P (3) 9P-3A (2)	7P-12M (1)
Northern South America	12N-6P (1)* 7A-11A (3) 11A-5P (4) 5P-7P (3) 7P-10P (2)	6A-4P (4) 4P-7P (5) 7P-1A (4) 1A-6A (3)	8A-3P (3) 3P-8A (5)	7P-5A (3) 10P-3A (2)**
Argentina, Brazil & Chile	3P-7P (1)* 7A-10A (2) 10A-5P (4) 5P-8P (2) 8P-11P (1)	4A-8A (3) 8A-2P (2) 2P-10P (4) 10P-4A (2)	2P-4P (2) 4P-1A (4) 1A-8A (3)	8P-1A (2) 1A-5A (3) 11P-4A (1)**
Central Asia	Nil	8A-3P (1) 3P-6P (2) 6P-10P (1)	6A-9A (2) 9A-11A (1) 5P-9P (1) 9P-11P (2) 11P-6A (1)	Nil
Hawaii	4P-6P (1) 6P-11P (2)	8A-3P (2) 3P-11P (4) 11P-1A (3) 1A-4A (2)	8A-11A (3) 11A-6P (2) 6P-4A (4) 4A-8A (3)	10P-7A (3) 12M-5A (2)**

ALL TIMES IN C. S. T. (cont'd)

CENTRAL USA TO:

	*6/10 Meters	15 Meters	20 Meters	40/80** Meters
Formosa, Hong Kong, etc.	6P-10P (1)	3P-7P (1) 7P-10P (2) 10P-12M (1)	7P-9P (1) 9P-12M (2) 12M-7A (1) 7A-9A (2) 9A-11A (1)	Nil
Japan & Far East	7P-10P (1)	8A-10A (2) 10A-2P (1) 2P-5P (2) 5P-10P (3) 10P-12M (1)	7P-2A (2) 2A-6A (1) 6A-9A (3) 9A-11A (2) 11A-7P (1)	Nil
Malaya & Southeast Asia	Nil	1P-4P (1) 4P-9P (2) 9P-11P (1) 6A-9A (1)	6A-9A (2) 9A-5P (1) 8P-11P (1)	Nil
Philippines & East Indies	Nil	2P-5P (1) 5P-11P (2) 11P-1A (1)	2P-11P (2) 6A-8A (2) 8A-2P (1)	Nil
Australasia	6P-8P (1) 8P-10P (2) 10P-12M (1)	3P-7P (2) 7P-11P (3) 11P-2A (2) 2A-6A (1) 6A-9A (2)	7P-11P (2) 11P-4A (4) 4A-6A (2) 6A-10A (3) 10A-3P (1)	12M-6A (2) 1A-5A (1)**
McMurdo Sound, Antarctica	1P-5P (2)	12N-2P (1) 2P-4P (2) 4P-7P (3) 7P-9P (1)	11A-3P (1) 3P-5P (2) 5P-7P (3) 7P-10P (1)	7P-9P (1) 9P-2A (2) 2A-4A (1) 9P-2A (1)**

[Continued on page 84]

ALL TIMES IN P. S. T.

WESTERN USA TO:

	*6/10 Meters	15 Meters	20 Meters	40/80** Meters
West & Central Europe	Nil	6A-8A (1) 10A-1P (2) 1P-5P (3) 5P-7P (2) 7P-10P (1)	3P-5P (1) 5P-10P (3) 10P-12M (2) 12M-4A (1)	7P-10P (1)
Southern Europe & North Africa	4P-7P (1)	6A-12N (1) 12N-4P (2) 4P-8P (3) 8P-10P (2)	7A-11A (1) 11A-5P (2) 5P-10P (3) 10P-7A (2)	7P-10P (1)
Central & South Africa	10A-1P (1)	9P-11P (2) 5A-8A (1) 8A-10A (2) 10A-3P (3) 3P-6P (2)	6A-9A (2) 9A-2P (1) 2P-5P (2) 5P-9P (1) 9P-1A (2) 1A-6A (1)	6P-9P (1)
Northern South America	12N-6P (1)* 7A-11A (3) 11A-5P (4) 5P-8P (3)	5A-2P (3) 2P-7P (5) 7P-1A (4) 1A-5A (3)	8A-2P (2) 2P-8A (5)	7P-2A (3) 9P-1A (2)**
Argentina, Brazil & Chile	3P-7P (1)* 6A-10A (2) 10A-4P (4) 4P-8P (2) 8P-11P (1)	4A-7A (3) 7A-2P (2) 2P-7P (4) 7P-11P (3) 11P-4A (1)	1P-4P (2) 4P-12M (4) 12M-4A (2) 4A-6A (3)	7P-3A (2) 9P-12M (1)**
Tahiti & Oceania	10A-6P (2) 6P-11P (1) 11P-4A (3)	9A-6P (3) 6P-4A (4) 4A-9A (2)	5P-7P (2) 7P-7A (4) 7A-10A (3) 10A-12N (2)	10P-7A (2) 11P-6A (1)**
Guam & Mariana Islands	12N-4P (1) 4P-6P (2) 6P-8P (3) 8P-11P (2)	7A-1P (3) 1P-8P (1) 8P-12M (3) 12M-7A (1)	8P-12M (2) 12M-8A (4) 8A-10A (3) 10A-12N (2)	1A-5A (1) 2A-4A (1)**
Fiji & Pacific Islands	11A-1P (2) 1P-8P (3) 8P-2A (2)	8A-6P (2) 6P-3A (4) 3A-8A (3)	7P-11P (2) 11P-8A (4) 8A-11A (3)	12M-7A (2) 2A-6A (1)**
New Zealand	3P-5P (1)* 11A-1P (3) 1P-8P (4) 8P-10P (2)	9A-12N (2) 12N-5P (1) 5P-9P (3) 9P-12M (2)	6P-8P (2) 8P-12M (3) 12M-8A (2)	11P-6A (2) 1A-5A (1)**
Australia	3P-6P (1)* 10A-1P (2) 1P-4P (3) 4P-10P (4) 10P-12M (2)	11A-1P (2) 1P-8P (1) 8P-12M (3) 12M-3A (2)	7P-10P (2) 10P-4A (4) 4A-8A (3) 8A-10A (1)	9P-12M (1) 12M-4A (2) 4A-7A (1) 11P-2A (1)**
Philippines & East Indies	8A-11A (1) 11A-4P (3) 4P-10P (2)	12M-2A (2) 2A-8A (3) 8A-11A (2) 11A-3P (1)	11P-3A (1) 3A-9A (2) 9A-12N (1)	3A-5A (1)
Hong Kong, Formosa, etc.	12N-2P (1) 2P-8P (2) 8P-10P (1)	7A-12N (3) 12N-8P (2) 8P-2A (3) 2A-7A (2)	10P-2A (2) 2A-8A (3) 8A-1P (2)	2A-6A (1)
Japan, Okinawa & Far East	11A-4P (1) 4P-8P (2) 8P-10P (1)	8A-12N (3) 12N-7P (2) 7P-12M (3) 12M-8A (2)	9P-12M (2) 12M-9A (3) 9A-12N (2) 12N-9P (1)	2A-6A (2) 3A-5A (1)**
Malaya & Southeast Asia	10A-4P (1) 4P-6P (2) 6P-8P (1)	10P-2A (1) 2A-6A (2) 6A-8A (3) 8A-12N (2) 12N-2P (1)	12M-2A (1) 2A-7A (2) 7A-12N (3) 12N-2P (1)	Nil
Siberia	1P-4P (1) 10P-2A (1)	4A-10A (3) 10A-1P (4) 1P-8P (3) 8P-4A (4)	7P-10P (3) 10P-8A (4) 8A-12N (3) 12N-7P (2)	1A-6A (2) 2A-5A (1)**
Central Asia	8A-12N (1) 5P-7P (1) 7P-9P (2) 9P-11P (1)	6A-9A (3) 9A-11A (2) 11A-3P (1) 3P-8P (2) 8P-2A (1) 2A-6A (2)	5P-9P (1) 9P-12M (2) 12M-7A (3) 7A-10A (2) 10A-12N (1)	3A-6A (1)

SYMBOLS FOR NUMBER OF DAYS CIRCUIT FORECAST TO OPEN:

(1) 1-4 days (2) 5-11 days (3) 12-18 days (4) 19-26 days

(5) over 26 days

* Indicates possible six-meter openings.
** Indicates possible eighty-meter openings.

Time Symbols: A - A. M. N - Noon
P - P. M. M - Midnight

The CQ DX Propagation Charts are based upon a CW radiated power of 150 watts at radiation angles less than thirty degrees and are centered on the Eastern, Central and Western areas of the United States. They are valid through July 15, 1959. These forecasts are based upon ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

CLUB BULLETINS

Marvin D. Lipton, VE3DQX

311 Rosemary Road, Toronto 10, Ontario, Canada

About 10% of the publications in our Ne Service and Club Bulletin Department a sponsored by groups other than ham clubs. O such publication is a dandy little gem w worth mentioning.

The boys on the West Coast that opera regularly in the traffic nets will be familiar wi the *Pacific Area Net News.* This monthly jou nal is crammed with valuable information f the traffic men. V. S. Gish, W7FIX, of Seattl Washington, is the chap in the driver's se and each month he prints news, net rosters, a ideas concerning the Army MARS, AF MAR CD, and other nets in the Pacific Area. T bulletin is neatly stapled and usually runs abo 26 pages. In addition to the regular editio there is a supplement that is composed of n schedule timetables, pictures, operating a nouncements and pertinent data. Contributio to the paper are by no means limited to t U. S. crowd. The British Columbia Emergen Net is represented by its manager VE7AOT.

The duplicating process is used in the pr duction of PANN and the subscription rate $2.00 per year (11 copies). Although there no "free" or "exchange" list maintained the editor, you might drop him a note at 5 East 71st St., Seattle 15, Washington, and r quest a single sample.

Front Page News

The boys in the Lower Yakima Valley Am teur's Club Inc. read all their news on the fro page of their news sheet, *Radio Frequency.* T entire paper is printed on one coarse she measuring 17″ x 22″. An outstanding featu of RF is the monthly cartoon which is dra by Cormac Thompson, W7ACA. It's too b that we have no way of reproducing and d tributing the cartoons that appear from ti to time in various bulletins.

Photos

In the future, I intend to run an occasio photo in this column. If you have a small, cle picture and negative of your club tabloid se them and a brief history of the periodical.

Changes

As result of a questionnaire that was sent the editors in our News Service, there will a few modifications in this column. I'll elab rate next month. In the meantime here is list of the newest members in our midst: TH FARL BOLT, Ford A.R.C., QSA-5, Ma A.R.C. and the CRYSTAL PALACE NEW LETTER, Crystal Palace and Dist. R.C., Lo don, England.

73, Marv, VE3DQ

CONTEST CALENDAR

by Frank Anzalone, W1WY
14 Sherwood Road, Stamford, Conn.

Since there is no contest activity for the
xt couple of months, this would be a good
ie to answer a request made by many read-
. “How do you fellows go about judging
DX contest?”

Naturally right after a contest has taken
ce, the logs start rolling in, first from the
rby US districts and a little later from the
eign countries.

Rather than wait for a supply to pile up,
y are immediately sorted, first into contin-
s and later into countries and districts. As
s is being done, a tally sheet is also at-
hed to each log and the claimed score and
er pertinent information is noted.

As they are being filed we also check the
ring, tabulation and etc. An experienced
ntest checker can tell at a glance if every-
ng is in order or if the log needs closer
cking.

If the score is way out of line it usually
icates that the guy has been multiplying
rything in sight, instead of Zones PLUS
untries MULTIPLIED by the QSO points.
wever we don’t get many of these as most
rybody has been educated. They are also
w familiar with the rule of a completed
ntact counting 3 points, but only 1 point
en its from the same continent.

By this time we start to get a pretty good
a of who’s at the top of the Totem Pole and
entries are filed according to band classifi-
ion.

Now comes the real work, cross-checking.
necessity, because of the great number of
s, only spot checking in most cases. But if
ur score is in the top grouping you’ll get
re than that and if only one cross-check
s not jibe, you’re going to get a real going
r. So if the percentages have been working
you, don’t press your advantage too far,
ur luck might be running out and you and
could prove embarrassing.

Usually we deduct these phantom contacts,
well as duplicates and let it go at that, but its becoming a bit irritating and we are strongly considering the creation of a disqualification list. Certain errors are understandable, and ignorance of the rules can be forgiven, but this is a contest for two way transmission not SWLs.

Each year we receive a certain number of unscored logs. “I do not understand the rules, please check my log,” is the usual plea. If Ben happens to get his hands on it first its sure to end up in the check log folder. But I usually rescue it and Mac or Andy will do the scoring. Its no fun when there are 500 or more contacts and no separation is made from band to band. Unscored logs from distant points are understandable, but when the call is a W/K—well, Ben’s right, next year our check log list is going to get bigger.

There are many other time consuming details; checking the operating time on borderline cases, making sure its properly classified as to single or multi-operator, compiling the Club scores and etc. and etc. Some contestants are still sending us their phone and CW logs in the same mailing and you have to see some of these foreign logs to appreciate the difficulty we have in trying to decipher the information.

Finally everything has been checked and the winners detemrined. Now there is still the big job ahead of us of preparing the material for the printer and when that’s put to bed there is still a list of over 550 certificates we have to prepare.

Making out the certificates is Wayne’s secretary’s job, and does Kathie dread that tedious assignment, for its not only making out the certificates but the mailing labels as well and some of the foreign addresses are confusing.

I hope that in some small way this explanation will make you fellows realize the tremendous job we on the contest committee are confronted with each year. So before you send in that contest log next fall make sure everything is in order, it will be greatly appreciated.

73 for now, Frank, W1WY

by **CHARLES J. SCHAUERS, F7FE/W6QLV**

CQ Magazine, 300 West 43rd St., New York 36, N. Y

ham clinic

The cathode ray oscilloscope (hereafter referred to as a "scope") is the one test instrument with which most radio amateurs are not technically familiar; nor does the average ham have one in his shack. Of course, most hams know what a scope is but they do not know *exactly* how it operates and the many tasks it is capable of performing.

With a good scope, one can measure modulation percentage; perform receiver alignment; check relay operation; check vibrator adjustment and operation; compare push-pull and parallel tube balance; examine all types of waveforms; measure *af* amplifier distortion; check SSB and DSB performance; check power supply ripple and hum; check individual parts such as potentiometers etc.; line up phasing circuitry; check crystals; operate as a null indicator in various types of electronic bridges; measure voltages in impedance-sensitive cirsuits; measure and "see" various types of interference and many other tasks.

However, the scope is not always used alone. For example, in aligning a radio receiver a good signal generator is also needed. Most experienced hams can do a very creditable job of receiver alignment armed only with a good output meter and signal generator.

One of the reasons many amateurs shy away from the scope as a test instrument is because they realize that a scope does need supplemental equipment to perform the many test and measuring tasks it is capable of.

The "lab-ham" (one who does his own designing, construction, testing and so on) cannot do without a scope—to him, it is his "right arm."

One can buy scopes today for as little as $25.00 and go as high as $3500.00. But the scope needed by the average ham will seldom cost more than $70.00 and often very much less.

The ham who owns a *Tektronix, RCA, Dumont, Hickock,* or *Hewlett Packard* is indeed fortunate. On the other hand, so is the guy who has a *Heath* or *Knight.*

There *are* major differences in the low and high priced scopes. For one thing, extremely accurate calibration of all circuitry costs money so do real wide-band amplifiers. Sensitivity doe not come cheaply either.

What should a ham look for when buying scope? Well, this question may be answere in a number of ways. But I would say that th following criteria should be applied by th *average* radio amateur when selecting a scope

First of all, one must determine how muc money they have to spend; the amount wil "automatically" classify your choice. You can not buy a scope that "does everything" fo $25.00, and this goes for some of the highe priced scopes too. The average ham can get b very well with a 3 or 5 inch CR tube. Scop kits are available from between $35.00 t $70.00 and are easy to wire because most o them use printed circuitry where it count most for stability.

Scope sensitivity should be in the range o 25 to 30 millivolts per inch. Stable horizonta and vertical amplifiers with good bandwidt (roughly from about + or — 3*db* from cycles per second to a megacycle or so fo the vertical and + or — 2*db* from a few cycles per second to around 150 *kc* for the horizontal) are provided for in most low price scopes.

Automatic sync circuits are fine but no mandatory. However, the sweep-circuits shoul have adequate range—this means from aroun 25 cycles to at least 150 *kc*. It is taken fo granted that the scope will have the followin controls in addition to vertical and horizonta sensitivity and sweep controls: brightness, centering, off-on switch and possibly, calibration A scope having more than those mentione will either be a special purpose or a "bargain" scope.

Special purpose scopes such as those use in TV stations, industrial plants, laboratori and so on, may contain circuitry peculiar t the requirements of the job to be done. Fo example, the *Tektronix* 502 scope employs 2 gun cathode ray tube enabling dual beam presentation. It can simultaneously show inpu and output waveforms. Ideal for *af* amplifie distortion measurement!

In some applications like measuring AM
odulation percentage, scope amplifiers are
t needed. All that is necessary for this pur-
se is the CR tube plus power supply and
few controls (pots). RF and *af* are simply
d to the CR tube and the waveform obtained
sually a trapezoidal pattern) will indicate
ry accurately (by shape and size) modula-
n percentage. Sweep is supplied by the 60
cles obtainable from the power line.

Learning how to make various measurements
th a scope is not a difficult task but it takes
perience to interpret the many waveforms
tained.

Troubleshooting with a scope is a pleasure
one is wise enough to "pretest" equipment
d either photograph or note down the cor-
ct waveforms for a properly functioning
rcuit. When the equipment becomes inopera-
e, quick probes will indicate the defective
rt or circuit in no time at all.

If you are interested in reading more about
opes and how to use them, drop HAM
LINIC a line.

Observation

This is the time of year when a large num-
r of America's nearly 180,000 hams begin
acquire new mobile equipment or begin to
erate in earnest the rigs already installed in
e family jalopy.

I can think of no greater pleasure than
at derived from embarking on a long cross-
untry trip with an auto equipped with a
od selective receiver and a transmitter
pable of putting at least 20 watts into an
tenna.

Pulling into a strange town, you're not a
anger for long if you're a mobile ham.
talking to the local gentry you can be
ided to a refreshing swimming pool, a good
taurant or motel and get a wonderful guided
ur of scenic or historical spots.

So those of you who stay home and do no
obiling during the Summer months, why
t keep your receivers on and listen for
obile visitors? Still better, have your radio
b post signs at entrances to your town or
y which tells the visiting mobileer what
quencies to operate on for a quick contact.

In some large cities of the US there are
ny bed-ridden hams who have offered their
vices to help mobileers on a 24 hour basis—
s is what I call the *real ham spirit!*

This Summer the traffic will be thick on
st highways and by-ways. Be careful and
ep your eyes on the road. The guy who
es to operate his rig in heavy traffic using
handmike should have his head examined!
OP THE VEHICLE TO DO YOUR
ERATING IF YOU USE A HANDMIKE!

Let it not be said that "some crazy ham"
erating his rig was responsible for an acci-
nt which snuffed out lives.

Remember: IF MORE OF US DRIVE RIGHT, THERE WILL BE MORE OF US LEFT!

Questions

Industrial Electronics

HAM CLINIC is flattered that it has been receiving questions from various people who have on-the-job problems in the industrial electronics field. *Some* of the questions have been answered but *most* have not. This CQ service is exclusively for hams; no consulting work is done for anyone else. Again you are reminded that you should enclose a self-addressed *airmail* stamped envelope with your communication if you wish faster service. There is no fee, the service is free!

DX-40 Power

"My buddy and I (both 15 years old) are both novices who have DX40s. He contends that his transmitter has more output than mine. Any accurate easy way to settle the argument?"

Yes, but I'll bet there won't be much difference in output. (You did not say *how* your buddy knew his transmitter has more output and I think the argument is not a practical one). Well, here's the way to do it. Obtain a 60 watt lightbulb, connect it to the first transmitter to be tested. Place a photo exposure meter about 8 feet away from the bulb (all done in a dark room), load up the first transmitter and take a reading. Do likewise with the other transmitter—compare readings and continue your argument. (Be sure to use the same crystal and maintain the same distances between lightbulb and meter.)

TR Switch

"I have a homemade TR switch patterned after the one in the ARRL Handbook. The TR switch is connected directly to my transmitter's final. I notice that on frequencies to which both transmitter and receiver are tuned that there is a drop in received signal (when the TR switch is connected). I have some noise too. How come?"

The final tank circuit in your transmitter is no doubt acting as a "nice" absorption circuit. Don Stoner in his new SSB Handbook calls it "suck-out." Little you can do for this except to capacitively divide the *rf* path between transmitter and receiver or operate the transmitter on one frequency and the receiver on another.

Your noise is another problem. You can bias off your final or use diodes back to back to ground at the receiver (this helps a little). If you do the latter, receiver recovery time will be improved.

SSB Power

"Why is it that a transmitter rated for

[*Continued on page 106*]

OVERSEAS ECHOES

Thomas K. Aalund, K2VBI
Box 13
Roslyn, L. I., N. Y.

We did not run this column in the last issue in order to make more room for other items in the special May issue. This month we are back again and the multitude of magazines that has built up on our desk makes one wonder where to start. We shall introduce to you, another one of our contemporaries from the continent, **Radio REF,** which is the official organ of the French amateurs. The name of their association is *Reseau des Emetteurs Francais,* and their official club station is F8REF.

Overseas membership, which includes the magazine, is 2,400 francs. Correspondence should be directed to REF, Boite postale 42-01, Paris R.P., France. In as much as we frequently receive inquiries concerning subscription rates and availability of foreign magazines we shall include this information each month for the "feature of the month" magazine.

The March issue, which incidentally is over 70 pages, has on its cover a picture of an overseas member of the REF, VE2AFC, and his shack. One of the first articles in this issue gives a report on FB8YY. In a continuation of an article started in the February issue ("Transistor Practices") F8ZV's interpretation of parameters and design techniques are covered. Each issue also has several pages written for the newcomer to our hobby. This time data is given for the addition of bands to a receiver for the beginner, described in previous issues.

This issue also introduces the beginner to design principles of transmitters. In future issues they will describe, in detail, the design and construction of three transmitters of increasing complexity. The first one will be a fifteen-watt rig for 80 and 40 meters, the second one will cover all bands with the same power rating. The third rig will be 50 watts on all bands. All rigs will include power supplies and modulators. While ready-made rigs are convenient and kits are a lifesaver for hams with limited shop facilities, building a station from the ground up is possibly one of the best ways to become familiar with our hobby and to get "tuned up." Too frequently even hams who have the facilities and the time overlo
the fun and the sense of accomplishment th
can be derived from building one's own equi
ment.

The next article is by F9ND and is entitle
"Theoretical and practical considerations o
the choice of a *vhf* antenna." Further articl
on the same subject will appear in future i
sues. A more specific article on *vhf* antenn
is written by CN8AC. Ever try a **cubical**
two meters??? This fellow has stacked fo
of them designed for 144 *mc* and the si
of the complete array is less than six by s
feet and less than two feet deep. The impe
ance of the system is 75 ohms. In as much
there are only four two-meter stations
Morocco at this time, extensive tests could n
be performed but CN8AC wants to hear fro
anyone who is going to try this system.
self-addressed envelope will bring a sket
with exact dimensions if you send same to m

More on two meters: F8ZW describes
two-meter transceiver. Input to the final is
watts phone or 15 watts cw. The receiver se
tion has dual conversion and the comple
unit measures only 8½ x 6 x 11 inches. A
tubes used are either American types or ha
American equivalents.

With a five-element beam eight countr
were worked during 1958.

The above rounds out the articles in th
issue of *Radio REF,* the balance being tak
up by regular monthly features. A detail
propagation chart covers 3½ pages. The *v*
column covers five pages in addition to whi
there is a full-page ad for the REF national *v*
convention on May 9 in Paris under the cha
manship of F8OL.

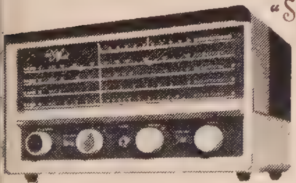
Another column, "Analyses de Revues,"
the equivalent of this column, and we see o
column mentioned in it. Merci beaucoups. "
Reseau d'Urgence" is a column devoted
emergency communications. They have a n
work covering the whole French Union. T
contest column lists several contests and gi
the results for the 1958 REF contest. Hig
point man for this country is W8WT on pho

[*Continued on page 96*]

ais is "the house the hams built"

re, Leo I. Meyerson, W0GFQ, and Alan McMillan, 0JJK, discuss the very best terms to be offered a stomer on trade in of his present equipment. Top des can always be given because World Radio's pert Reconditioning Department and ready Used uipment market insure fast turnover. On new gear, e serial numbers are guaranteed, easy financing is dily available, and promptest, most personalized vice is offered. Buy now at World Radio . . . "the use the hams built!"

National NC-60 *"Special"*



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____

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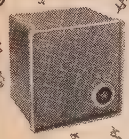
For further information, check number 27 on page 126.

HAMMARLUND
DOLLAR DAYS
MAY 15th to JUNE 30th



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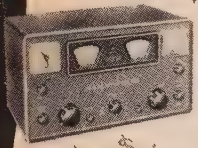
$250.00



HQ-100 DEAL
Same deal as above except general coverage HQ-100 receiver. Regular price $189.00, you get clock-timer and speaker with receiver for only
$190.00

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For further information, check number 56 on page 126.

SCRATCHI *[from page 61]*

shun, neon bulb flickering on acct. local B stayshun are on air. If stayshun going off a then bulb not flickering, and amchoor knowi Conelrad are on, so he staying off air.

Now, howsumever, when amchoor going o air, he not wanting to being bothered with ha ing to going off air if Conelrad alert are bei called. That where S.C.M. being so good. Wh amchoor being on air, his own signal cawsi BCI to BC set, so neon bulb flickering from h own signal. Aren't that reel peechy sistem?

Hon. Ed., if you feeling that can't putti ad in Hon. Mag. on acct. I not having a money, then telling you what I going to d You can having hole idea for five bux—cas What sa?

Respectively you
Hashafisti Scratc

YL *[from page 65]*

YL" contains 169 pages, over 500 photograph covering all phases of YL participation in Ha radio. Completely up to date with 1959 YLR officers, new certificates available, rece awards issues, etc. (Anyone who has the bo and would like the additional two pages, se a couple of 4¢ stamps to W5RZJ.) "CQ YI is now $3 per copy, postage paid. Order fro W5RZJ (QTH at beginning of column); boo autographed if you wish.

National Convention

Last call for the 11th National Radio Co vention to be held June 19-21 at the Moo Convention Center at Galveston, Tex. Che this column in May CQ for YL activiti planned.

33, Louisa, W5R

VHF *[from page 70]*

New York, New York From a transplant Ohioan, Phil Seldon (W8AXX) we receive bit of two meter news for a change.

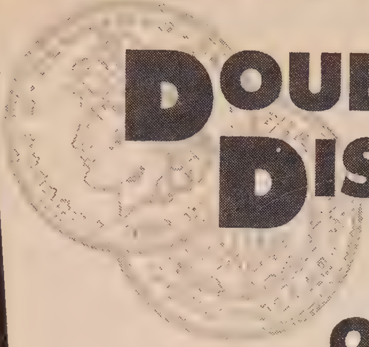
"I am now settled again in New York Ci after spending the last six years in Dayto Ohio. (Home of the Hamvention.) I am s on two meters, low power at present but a planning to QRO/KW equipment is in t corner but since I am living in a large apa ment house I must use reservations befo putting more than 100 watts on the air. Ante na is an eleven element yagi, 85 feet abo ground."

"Two meter activity here is much differe than in Ohio. Have made more than 100 co tacts with 77 different stations since Janua 22, 1959. A few practices in this area shou be rectified: (?) tuning only around on

Bob Henry
WØARA
Butler, Mo.

Ted Henry
W6UOU
Los Angeles

Now! Henry announces a New DOUBLE DISCOUNT Plan ON Collins S LINE EQUIPMENT!



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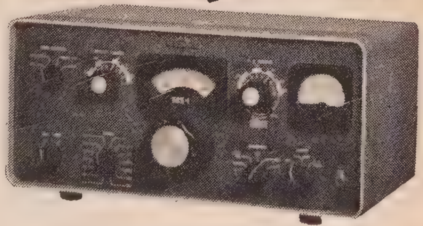

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312B-3 SPEAKER	27.50
312B-4 SPEAKER CONSOLE	185.00
KWM-1 TRANSCEIVER	820.00

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frequency (*isn't that annoying?*); (2) not announcing the other stations frequency at th end of a QSO; (3) unstable *vfos* and *ac* carriers; (4) phone in the first 100 *kc;* (5) vertical polarization."

"Am planning 80 elements at 850 feet an a *kw* for nightly transmissions to Europe. I all goes well with plans I will be set up b the summer and will need the help of abou ten NYC area hams to operate the statio Interested persons should contact me at W 7-5681, or write to me at the "Dayton Astronomical Instrument Co.", 152 West 42nd St New York 36, New York." *Sounds like mighty interesting summer you have ahead o you Phil——Wish I was there.*

Oakland, New Jersey Bruce Bouvier (W2RHE sends a bit of information from his area:

"Thought I'd let you know some of the active stations on six meters in this area, K2VMT John; K2OGW, Jim; W2GPX, Bob; and W2RHE, Bruce. I've been on six since Decembe 1, 1958 and am looking for a sked abou 1600 any day, looking especially for Maryland, Delaware, Virginia and South Jersey *Wouldn't you know that south Jersey woul be in that list?*

"The rig is a Globe Scout 680, BC-348 with three tube crystal converter. Antenna i a three element telerex and also a ten elemen two meter beam."

"We are in favor of giving the novice th upper portion of six and giving the technica two meters." *But did you let the FCC hea from you about same?*

"Has anyone succeeded in using a Heat VF-1 with a Globe Scout 680? I just can get enough drive with it using the 40 mete position. Any information from anyone gratefully accepted." *Nice to hear from you Bruc hope you keep up such good habits.*

Hoschton, Georgia Ole contester Jay, (K4KLD) advises us of an error made and als emits with a bit of 220 news: "Received m March 'CQ' and noticed that the printer ha switched photos on W1LMZ and yours trul *Don't blame it entirely on the printer Ja it may have been his fault but it is possib that it was my error. To be truthful I don know who made the slip.* "It was quite a honor for K4KLD to be listed under such nice rig, but just wonder if Dave went int orbit after noting the poor excuse for a station under which he was listed. *I'm sure h did not, Dave is also a very nice guy; howeve my apologies to both of you.*

"The six meter band has not been so goo lately, hope it improves soon. *It will!* Howeve activity has been building up on 220 and he are a few of the stations in North Georgia th have (or are building) 220 *mc* equipmen W4FWH, W4UML, K4TFY, K4QAB, K4KLD, and there are probably others of whom

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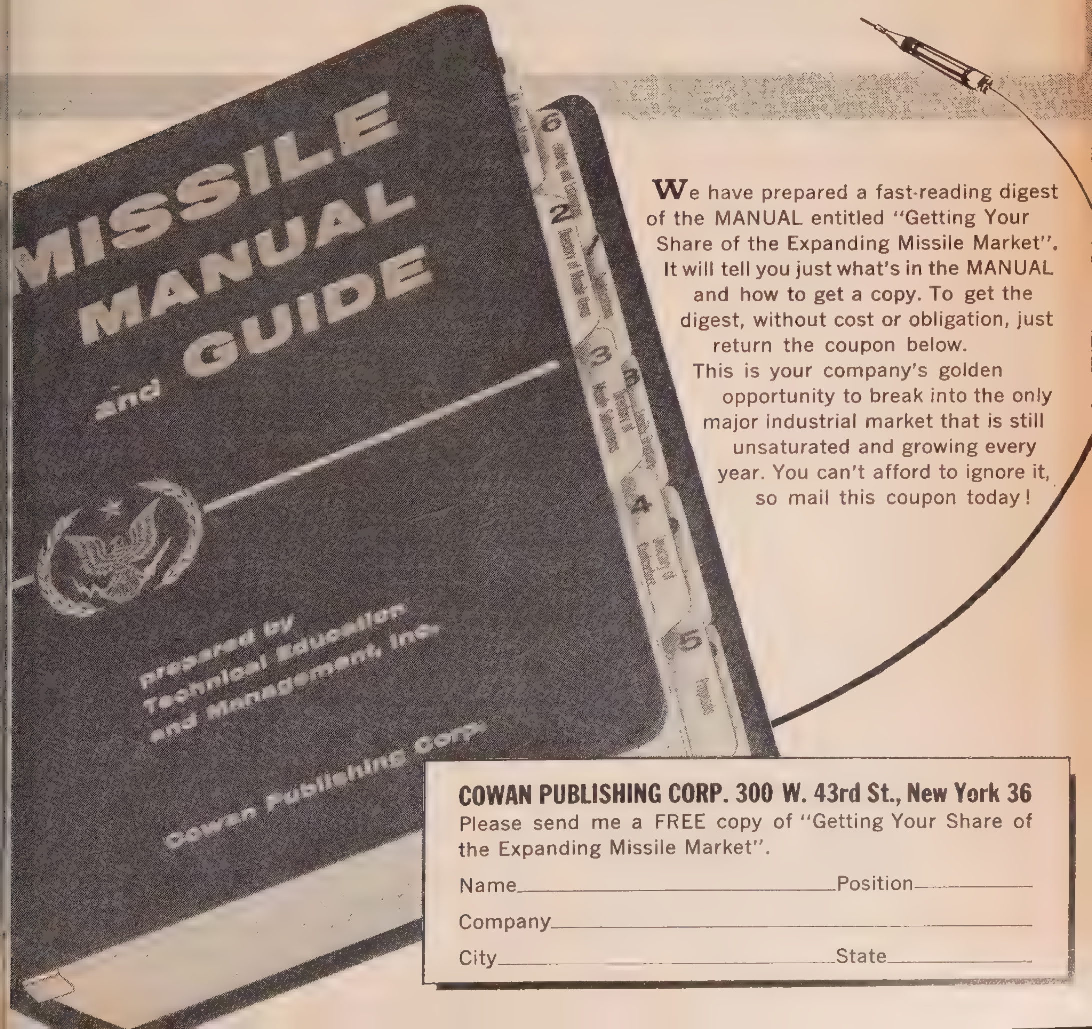

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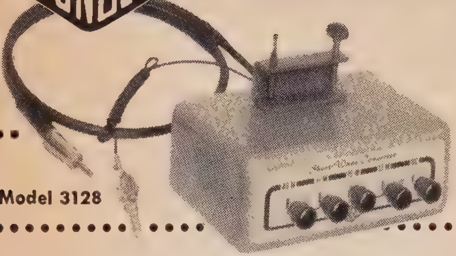

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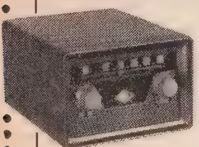

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don't know. Hope to get some good 220 mc contacts in the April VHF Contest." *Hope you did, Jay.*

Rahway, New Jersey Bob Brown, (K2ZSQ), Editor of "Channel A", says a few things from New Jersey way. "On the JA1's I hear a while back, no, I didn't work any. They were really weak and most in QSO at the time."

"It's been a long time since we've had any openings at all. They only occur on Sunday mornings down toward Ecuador. I haven't worked friend HC1FS but several locals have, including K2USW of Brooklyn, New York."

"Every night for several weeks now, we've had a very consistent aurora condition. Hear W1's, W3's, W4's, W5's, W8's, and W9's in there all the time. It seems that the local ragchewers just desert the first 100 *kc* when these occur, leaving it open for us CW hounds, as the phone stations are actually rare then."

"At the present using 5 watts output, I've racked up 36 states. I think my biggest thrill was working three VE3's the same day, I did it the hard way. During those west coast openings, I snagged over 50 stations in California, Oregon and Washington. Then I was running one watt out. Using 1 watt on DSB, I managed W7MAH, Reno, Nevada."

"I'm sending a 'CHANNEL A' certificate along, also. These are available to anyone who operates on Channel A, 50.2-50.3 *mc*." *For further particulars on these certificates contact Bob Brown, K2ZSQ.*

73, Sam, W1FZJ

SURPLUS [*from page 75*]

ary 1949. Volume II of the Surplus Radio Conversion Manual ($2.50 from the Radio Bookshop, see ad in CQ) covers a lot on this equipment as does the Radio Handbook, Volume Eleven, now out of print. The ART-13 is a fine piece of gear that requires little conversion.

From down in Florida, W4FZV asks for any information on the conversion of the Bendix Radio Compass MN-26LB. Out in California Bill Ruiter, a teacher at the Ganesha High School needs information on the Lewyt 38TO-MC receiver. The Ganesha H. S. address is 1151 Bellevue Ave., Pomona, Cal. Up in Oregon, LaRay Armstrong, Rager Ranger Station in Paulina writes asking about information on the TS-34 Scope, the BC-669 and the I-176, especially instruction books. W7KOL needs the RAK-8 handbook, while Harry Todd, 4165 Holloway Drive, Salt Lake City, Utah needs books on the DAU direction finder equipment. W7MBV is trying to locate information concerning the MAR equipment, which was battery operated gear for 220 *mc* used by the Navy. K2BNS has some civilian surplus, namely the Motorola T43G-16A-SP-1 and wants to get it going.

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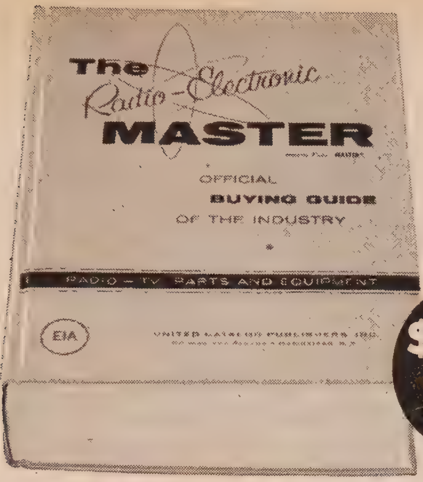
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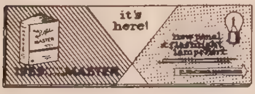

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who is A/2c Richard Wilde, 11800 Davis Street, Sunnymead, California, and he needs help converting the BC-684, the BC-924 and an R-316/ARR-26. From down under we find that D. S. Pratt, 91 Paget Street, Hilton Park, South Fremantle, Western Australia needs anything in the way of BC-348 data he can get. W5TVG has a BC-447A and is looking for books and conversion data for putting it on the air as 40 meter RTTY gear. K0BNZ needs the manuals and conversion data for the BC-611 handie-talkies.

W1EKP has a TS-12/APT and an ID-340/FPS-8 and is looking for any details on their use, as well as schematics of the TBX-2. K4GJC needs information on the Navy TCC-3 so he can convert it to civilian defense use. Both Ross Klinger of 1201 Shakespeare Avenue, Bronx 52, N. Y. and myself would like to get manuals on the ARR-2 receivers. Ward Thurber c/o Grundy, Schroeder & Co. Industrial Building, Detroit 26, Michigan is looking for a handbook on the Navy YG-1 homing equipment. K3EHM has need for the data on the ASB-4, ASB-8, BC-367 and the RT-10/APS-3. W1AQS is looking for the LM-10 schematic. John Keenan, 1237 Upper Ridgeway Road, Charlestown 4, West Virginia wants to get his BC-224-E operating and needs its manual. K4TWS wants to get the B-19 MkII set conversion so he can get on the air. K2ZCO needs the RBM-4 receiver handbook.

Stan Cichy, RD-1, Burnt Hills, N. Y. needs a parts list and a schematic for the T-50/CPN-8 and the TS-121/CPN-8. George Maas, 241-22 85 Rd, Bellerose 26, N. Y. is getting his novice ticket and needs help with his SCR-AR-283 in converting it to 110 vac. W5VK needs information on improving the BC-348R crystal filters, as well as a handbook on the LM frequency meter. W0CLC needs information on the BC-191. George Miller, Forest Lake Academy, Maitland, Florida needs the schematic of the RA-1B receiver.

If you have written to this department and haven't received a reply it is usually for one reason, no address. It is amazing to see how many people write in for information without adding their QTH to the letter. I have a set of schematics from some poor chap who asked for help on a tuning unit. He no doubt spent much time drawing it up and is waiting patiently, but alas, I don't even know where to send the answer he desperately needs. So . . . if you have a request please put your call and name and address on it so I can help.

73 Ken

OVERSEAS *[from page 88]*

and W3FYS on cw. In another column awards are listed. An additional sixteen pages are devoted to news from the various sections of the REF, listing of new members and qth changes. From the above it can be seen that this is a

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well-rounded magazine. This incidentally is their 31st year of publication.

Other Publications

Other publications this month include several interesting items and we shall start with the *Short Wave Magazine*, in the March issue of which we find the "Compressed ZL-Special." This is a ten-meter beam, inductance loaded and *both elements are driven*. Elements are only 134" long. The writer of the article, J. F. Vaux (G3KWH) gives all required details and is willing to answer any inquiries if return postage is provided.

The same issue also states that there has been formed the "Amateur Radio Mobile Society" to further the mutual interests of mobile operators in G. This self-supporting club grew out of the initiative of G2CDN.

The February issue of the same magazine has the SSB Topics column by DJ0BX, ex DL4SV (also W9NTV). This apparent callsign confusion is caused by a new ruling affecting DL4 calls. Only U.S. military personnel may now hold DL4 calls. A re-licensing procedure has produced the new DJ0 prefix for all non-DL nationals not elegible for DL2, DL4, or DL5 calls. The net result is a new prefix. The subjects of Jim's column this time are linear amplifiers, circuits by G2MA, ZL1AAX, and W6EDD. In all cases the final is an 813.

Novice Handbook

Novice's Handbook, by CR7BN reached us recently. It is published in Portuguese and English. The items covered in the pamphlet are not new but the treatment is novel. The countries list e.g. gives an alphabetical listing which also contains the following items for each country: Continent, zone, prefix, and geographical latitude and longitude. This last item is an excellent idea and helpful in locating some of the small countries. Those interested contact CR7BN directly at Box 875, Beira, Mozambique.

QTH—LISTINGS. As in the past, we keep on file the latest QTH listings as they become available to us. We now have the complete listing of all OE stations except for a few who are not members of the Austrian club.

TV Fine Tuner

Television fine tuning devices generally hold very little interest for the ham, but a relatively new system deserves attention. Grundig Radio of West Germany has introduced an automatic fine tuning device which does not require additional tubes and should also lend itself to remote control of amateur *vfo* units. The coil of the *vfo* is in a magnetic field, the intensity of which is remotely variable for such an application and the result is control of the oscillator frequency. Greater temperature stability

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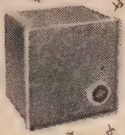
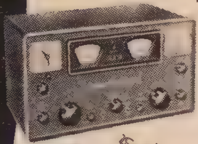


HQ-110 DEAL

Buy a famous, current best-seller HQ-110 (Amateur coverage) receiver at regular price of $249.00. Add $1.00 more and get clock-timer ($10 value) and S-100 speaker ($14.95). EVERYTHING ONLY

$250.00



HQ-100 DEAL

Same deal as above except general coverage HQ-100 receiver. Regular price $189.00, you get clock-timer and speaker with receiver for only

$190.00

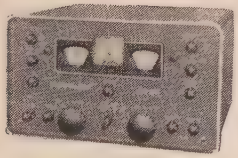
$1.00 GETS YOU $24.95!

DON'T MISS OUT!!

WRITE
WIRE
PHONE

STAN WØBJV

ALWAYS A TOP DEAL ON THESE OTHER GREAT HAMMARLUND RECEIVERS



HQ-160

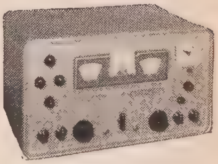
Everything you could wish for in general-coverage! 13-tube superheterodyne with automatic noise limiter. Dual conversion 540 KCS to 31.0 MCS. Crystal calibrator. Electrical bandspread. Slot filter. Q-multiplier.

$379

HQ-170

Best for the amateur at any price! Dual and triple conversion 17-tube superheterodyne with automatic noise limiter. 60 db slot filter. Separate vernier tuning. Selectable sideband. Tuned IF amplifier. Crystal calibrator.

$359



HQ-145

Brand-new general-coverage receiver! 540 KCS to 30.0 MCS. Dual conversion. Adjustable 60 db slot filter. 11-tube superheterodyne with automatic noise limiter.

$269

SEE TRADING POST PAGE 104 FOR COMPLETE USED EQUIPMENT LISTING. SEND IN TODAY FOR LATEST CATALOG. MENTION AD 659.

Burghardt RADIO SUPPLY, Inc.

P.O. Box 746
Watertown, S. Dak.
Turner 6-5749

For further information, check number 31 on page 126.

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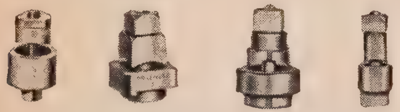
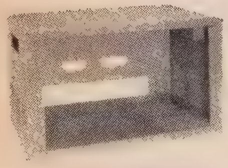
IN 1-1/2 MINUTES
(OR LESS)
with Greenlee
Chassis Punches

Many sizes . . . quickly make smooth, accurate holes in metal, hard rubber, or plastics . . . for sockets, plugs, controls, meters, panel lights, etc. Easy to use, simply turn with a wrench. Write today for free literature.



GREENLEE TOOL CO.
1783 Columbia Avenue, Rockford, Ill.
GREENLEE
For further information, check number 32 on page 126.



32V3 – 75A3 CABINETS
10½" x 19" Panel Space. 13½" Clear inside depth. 21" x 12⅛" x 14" overall. Sturdy, Shielded, Attractive. In Black or Gray Wrinkle. (Specify Color)

COLLINS OWNERS:
Match your accessories to your receiver and rig. Blank matching panels available.

$19.95 ea. — $15.95 ea. in lots of 3. $11.95 unpainted but primed. Matching Panels: Steel, $4.00 ea., Aluminum, $5.35 ea.

GRALLEN ELECTRONICS Morristown, N. J.

Look for this emblem on CQ Handbooks in your favorite bookshop or ham dealer.

CQ Technical Series

is claimed than can be obtained with tube-equipped control systems.

Letters

A letter from LU2AO advises us that the Centro Radioveteranos has been formed in Buenos Aires. It is an old timers club and has about 150 members, under the presidency of LU9AE. A picture sent to us shows the first meeting. The club has inaugurated the radio veterans' day in Argentina, May 21, 1959, commemorating the first contact between LU and ZL, 35 years ago.

73, Tom, K2VBI

DX [*from page 77*]

news and blues this month. It's too bad summer doesn't last a little longer.

Bits and Pieces

AC3-SIKKIM — Several W6's recently worked AC3SQ on 14080.

AC4-TIBET—JA5AI advises that AC4AX is on 14050 as well as 14100. Hy-Gain has sent several beams to rare DX stations, including AC4AX. (Tnx NCDXC and WGDXC)

AC5-BHUTAN—UB5TV reports working AC5PN on 14100 at 1030 GMT.

BV1-FORMOSA—The QTH given for BV1USB is apparently incorrect. W3JKO's card was sent to APO 140, San Francisco, and was returned with no such APO.

CR10-PORTUGUESE TIMOR—CR10AB has been active on 21 mc. He has worked several VK's and is putting up a beam for 21 mc. He has not been heard in the states at this writing. (Tnx NCDXC)

EA0-SPANISH GUINEA—EA0AF is now active with a 500 watt rig both phone and CW. He's putting up a beam and he is a good operator. (Tnx W7PHO)

FB8-COMORO ISLANDS—FB8CD continues intermittently active from this spot on 14065, around 1500 GMT.

KC6-EASTERN CAROLINES—A plane bound for Truk, Ponape, and Majuro Islands recently had to jettison all mail to save the passengers. Cav, KC6JC, was worried that a lot of cards bound for him for QSO's in the ARRL DX contest may have been among the mail. If you have not yet received your KC6JC card, please send Cav another one. (Tnx W3JKO) KC6TM is in Eastern Carolines and is active around 1000 GMT. He's a new ham. (Tnx K2QXG)

VS5-BRUNEI—Harry ex ZL4JA continues to be active from this spot on various frequencies, however, he is hampered by a poor receiver. QSL to Harry McQuillan, c/o B. S. P. Co. Seria, State of Brunei. (Tnx W6PHF)

4S7-CEYLON—The 4S7 ban is off and all

[*Coninued on page 104*]

Correction

144 MC Broad Band Receiver, May '59, age 58. Capacitor C13 is 10 mmf. Wire for FC 1 and 2 is #18. Coil data is as follows:
1—4t #20 space wound ½" long ⅜ o.d. Ceramic form. ap 1¼" from top.
2-2½t #20 space wound ⅜" long ⅜ o.d. Ceramic form.
3-3t #20 space wound ⅜" long ⅜ o.d. Ceramic form.
4-3t #20 space wound ⅜" long ⅜ o.d. Ceramic form.
5-3½t #20 space wound ½" long ⅜ o.d. Ceramic form.

W CONTEST [*from page 45*]

VR
AB 501,767 615 98 203 D
K6EVR—W6GFE—W6UED)
JY
AB 9,912 65 26 33 C
(K6PJY—K6QHC)
CQ
28 2,530 49 11 12 B
(K6ICQ—K6ICS)
WO
14 122,092 322 37 94 D
(W6FWO—W6GHG)
EX
14 42,082 140 33 73 D
(W6OHX—W6ALQ)
YT
7 5,022 65 14 17 D
(K6CYT—K6EGF)
ML
AB 101,745 256 57 96 D
(W7TML—W7WJB)
ZA
AB 56,782 178 37 77 B
(W8QZA—K8DFX)
PX
28 6,171 43 21 30 C
(K8BPX—W8ATK)
VCE
AB 51,896 176 34 70 C
V9WCE—K9LBL—K9KFS)
NTA
AB 302,204 431 84 167 D
(WØNTA—WØNUC—
WØPKH)
ZQV
AB 115,166 246 68 110 D

nada

WW
AB 320,133 467 87 180 D
(VE2WW—VE7HC)
UOT
AB 241,462 432 81 150 D
E2NI—VE3BBM—VE8OW)

aska

BWR
AB 43,632 410 25 38 D
(KL7BWR—KL7BES—
KL7BDG)
ALZ
21 32,298 502 15 33 B
(KL7ALZ—KL7YG)
PJ
14 103,693 666 31 66 D
(KL7PJ—KL7MF)

AFRICA

uth Africa

HI
A 297,651 718 56 85 —
(ZS2HI—ZS2LS)

ASIA

Ryukyu Is.

KR6QW
14 41,832 170 25 37 —
(KR6AA—KR6RP—KR6CK—
KR6EA—KR6HG—K7GNW)

U. S. S. R. Asiatic

UA9KCA
14 89,551 406 27 50 C
(Club Station)

EUROPE

Czechoslovakia

OK3KAB
A 127,670 415 56 116 B
(OK3-4061—OK3-6168)
OK1KLV
A 75,048 375 41 118 B
(Club Station)
OK1KKH
A 39,284 184 41 81 B
(Club Station)
OK1KJS
A 20,216 203 21 55 B
(Club Station)
OK3KGI
A 14,210 135 18 40 B
(Club Station)
OK3KMS
14 82,488 462 24 60 —
(Club Station)
OK2KAJ
7 6,764 153 8 30 B
(Club Station)

England

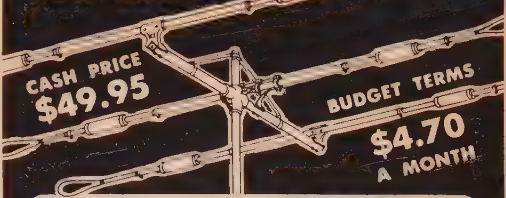
G3JXC
A 188,570 463 50 123 B
(G3JXC—G3IZW)
(G3KLK—G3MJL)
G2BOZ
14 76,380 427 21 55 B
(G2BOZ—G3HCT)

Finland

OH1AA
A 816,794 1120 78 193 B
(OH1NK—OH1PI—OH1QE)
OH1RT—OH1RX—OH1QE
OH1ST)
OH5AC
A 237,881 675 52 141 B
(OH5QN—OH5RO—OH5SK)
OH3AA
A 79,800 321 38 82 B
(OH3RA—OH3TQ)
OH6AA
14 22,020 176 17 43 A
(OH6OY—OH6PW)
(OH6QP—OH6TJ)

[*Continued on page 105*]

TRY THE TB-500 BEFORE YOU BUY IT!



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THREE BANDS — 10 — 15 — 20 meters SINGLE 52 ohm coax transmission line. Weight 29 pounds. Turning radius 14' 11". Handles 500 W. (transmitter input, 100% am modulated.) ELEMENTS: 6061-T6 Aluminum tubing 1" tapering to ¾".

Cast aluminum fittings used throughout. PRETUNED and easy to install. Uses Hornets' exclusive weather-sealed trap design*.

The TB-600 with larger diameter boom and slightly heavier castings weighs 35 lbs. This is the heavy-duty model for greater wind and ice-loading conditions. Budget-terms $5.50 a month or $59.75 cash.

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HORNET Antenna Products Co.

*Pat. pend. P.O. BOX 808 • DUNCAN, OKLA.

For further information, check number 33 on page 126.

WATCH for the JULY issue featuring ANTENNAS

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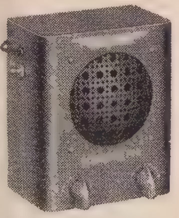
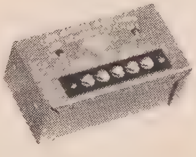


CODE PRACTICE OSCILLATOR AND MONITOR CPO-128A
Amateur Net $19.13

THE ONLY OSCILLATOR WITH BUILT-IN MONITOR WHERE NO MODIFICATION IS NEEDED TO CHANGE FROM OSCILLATOR TO MONITOR AND BACK AGAIN. It has 2 tubes and a built-in 4" dynamic speaker. Operates on 110V. AC or DC. Also avaliable in earphone model CPO-130A at $16.50.



CODE PRACTICE OSCILLATOR AND MONITOR CPO-155T
Amateur Net $5.88

THE LOWEST PRICE COMPLETELY TRANSISTORIZED COMBINATION C.P.O. AND MONITOR ON THE MARKET. It's small, yet rugged. Works indoors and outdoors. Performance compares favorably with higher priced earphone model.

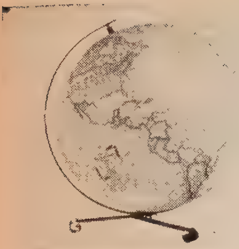
See these and other Bud Products at your nearest Bud Distributor.

BUD THE MARK OF PERFECTION

BUD RADIO, INC. 2118 East 55th Street
Dept. C., Cleveland 3, Ohio

For further information, check number 57 on page 126.

THE HAM SHOP



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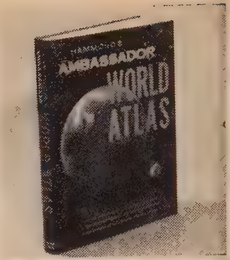
We can't see how you can get along without this beautiful 19-inch, 8 color World Globe. It can be yours, including a one-year subscrip- to CQ for: lighted model W/bulb $24.95; unlighted model $19.95.

ATLAS

Come on, get with it. Don't pull a blank when some one asks you for the capital of Honduras. For only $12.50 you can own 7 lbs. of full-color maps and a complete gazeteer. Send for this Hammond Atlas. PLUS a one year subscription to CQ.

only $12.50

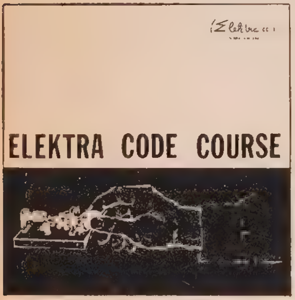


COMMAND SETS

This IS a collection of reprints, containing all of the available information on the conversion of the popular "Command" transmitters and receivers into good ham transmitters and receivers. Invaluable for Novice, Technician, General, Advanced and Extra class operators. 136 fabulous amazing terrific pages for only $1.50 PPD.

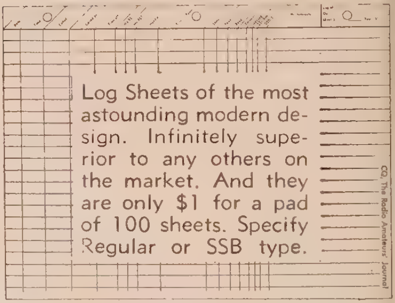
MOBILE HANDBOOK

This new Mobile Handbook by Bill Orr, W6SAI, has been getting raves from all of the experienced mobile operators. There is all sorts of information in here that cannot be found anywhere else. This is NOT a collection of reprints. $2.95 postpaid.



CODE RECORD

Learning code is a snap with this record. Speeds from 3 to 16 WPM, depending upon turntable speed. This 12" LP record has on it all you need to learn the code for both the Novice and General license. $3.50 each.



Log Sheets of the most astounding modern design. Infinitely superior to any others on the market. And they are only $1 for a pad of 100 sheets. Specify Regular or SSB type.

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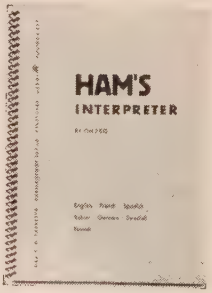
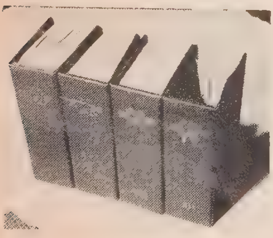
Now you can talk in broken French, Spanish, Italian, German, Swedish and Finnish. This handy little book gives all the popular ham conversation in seven languages, including letters and numbers. Only $1.50 postpaid.



TVI HANDBOOK

W1DBM's newly written TVI book (no reprints) covers all aspects of curing TVI from both the Ham's viewpoint and that of the TV viewer or the TV serviceman. It includes 2 and 6 meter TVI as well as Industrial, Medical and Utility TVI. Profusely illustrated with diagrams, photos, charts, tables and FCC regulations pertaining to radio and television interference. Price: $1.75 postpaid, USA, $2.00 Foreign.

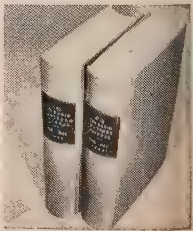


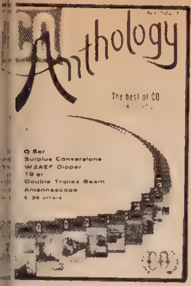
BINDER

There is no other good way to keep your back issues. Make 'em neat. We supply the binder, with the year embossed in gold, not merely a sticker which will come off later. Specify what year you want stamped on your binder. $3.50 each

BOUND VOLUME

By far the handiest way to keep your library. Why not go first class? This impressive volume is only $10.00. We only made a few of them this year, so don't expect to get one later. 1958 still available, released Jan. 1st.





CQ ANTHOLOGY

Down through the years CQ has had the honor of being there first with just about every major discovery in the amateur radio field. Unfortunately most amateurs do not have a good file of back issues of CQ to fall back on when they are interested in building up something or in improving their equipment. So we've looked back through the years 1945-1952 and assembled all in one place the articles that have made a lasting stir. The issues containing most of these articles have long ago been sold out and are unavailable. The price is a paltry $2.00.

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Television SCHEMATICS and SERVICE GUIDE

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96 Pages of 45 representative TV schematics, covering the most prominent TV manufacturers. Factory authorized, crystal clear and accurate. $3.00

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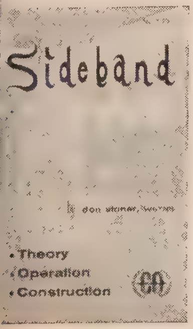
is nifty volume contains the test dope on amplifiers, pre-nplifiers and equalizers plus buyer's guide of component anufacturers!

ver 150—5½ x 8½" pages heavily illustrated descrip-ons covering Hi Fi Audio omponents — the greatest blication value in its field to-ay. Only $2.50 per copy



SIDEBAND HANDBOOK

Written by Don Stoner, W6TNS, was almost one full year in the preparation of this terrific volume. This is not a **technical** book. It explains sideband, showing you how to get along with it . . . how to keep your rig working right . . . how to know when it isn't . . . and lots of how to build-it stuff, gadgets, receiving adaptors, exciters, amplifiers. Price, only $3.00.

C-6

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SIRS: My check (money order) for $.................. is enclosed. Please send the following items to:

Name____________________

Address____________________

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New York City Residents Add 3% Sales Tax

Again in this issue a new section appears in CQ where distributors may advertise trade-in and reconditioned equipment. This section, called the TRADING POST, will be confined only to legitimate ham distributors as a means of announcing the many excellent used items available.

Reconditioned or Like-New Equipment

Collins 32V-1 Transmitter	$269.00
Collins 51J-3 Receiver, 500kc-30.5 Mc	575.00
Collins 75A-1 Receiver, ham bands	249.00
Collins 75A-3 Receiver, 3.1 kc filter	325.00
Collins R-390A/URR Rcvr 500kc—32 Mc. 4 filters.	
Western Electric Band Pass filters D165626	12.00
Hammarlund SP600 Recvr, .54-54 mc	349.00
Hammarlund HQ-129X Recvr, 54-30 Mc.	149.00

Alltronics-Howard Co.
Box 19, Boston 1, Mass.

TOP VALUES — LOWEST PRICES

B & W L-1000A Kilowatt Linear, **$325.00**; Central Electronics 10B Exciter, **$100.00**; Central Electronics 20A Exciter, **$195.00**; Collins 75A2 Receiver, **$295.00**; Collins 32V-3 Transmitter, **$449.00**; Eldico SSB-100M, demonstrator, **$325.00**; Eldico SSB-1000 Kilwoatt Linear, **$425.00**; Geloso G-209 Receiver, new, **$235.00**; Globe King 500B, like new, **$495.00**; Hallicrafters HT-32, **$550.00**; Hallicrafters HT-33, Kilowatt Linear with all new tubes, **$495.00**; Hallicrafters SX-101 Mark II, Receiver, **$295.00**; Johnson Ranger, **$189.00**; Johnson Valiant, **$349.00**; Johnson 500, factory wired, **$695.00**; Johnson Thunderbolt, factory wired, **$524.50**; Johnson 6N2, factory wired, **$129.50**; National NC-183 Receiver, **$159.00**; National NC-300 Receiver, **$275.00**.

BURGHARDT RADIO SUPPLY, INC.
WATERTOWN, S. DAK. • TURNER 6-5749

GUARANTEED USED EQUIPMENT

B&W 51SB-B $179.95; Collins 32V-3 like new $450.00; Eldico SSB-100A-FB condx—$495.00; Hall. SX-101 $319.95; Johnson Vik. I $159.95—Vik. II $239.95; National HRO-50T1 $315.00; HRO-60 $425.00; TMC-GPR-90 $375.00; National NC-300 $295.00—NC-109 $149.95.

Liberal Trades   Time Payments

WRITE FOR LATEST USED EQUIPMENT LIST
EVANS RADIO   PO Box 312   Concord, N.H.

SEE PG. 111

DX *[from page 100]*

gear has been returned. 4S7NG is very activ on 21048 and Frank ex VS1FJ is now 4S7F Don't know if Frank will continue as ZC3AC QSL manager from this spot. (Tnx W2HTH)

9N1-NEPAL—The Cook Electric gang, i stalling SSB gear in Nepal, has been assigne the following calls: 9N1AA, 9N1AB, 9N1A and 9N1AD. **STAND BACK!**

CONTEST: We're moving into W1WY's te ritory now, but here goes. . . .

The Astoria (Oregon) Amateur Radio Clu W7QXS is sponsoring a DX Contest to c incide with Oregon's 100th Anniversary Statehood. Called the Oregon Centennial Clu membership will require 100 contacts with di ferent Oregon hams during the Centenni Year, Calendar, 1959.

Figure score as follows: Multiply number contacts by 222, add kilometers you are dista from Oregon's state line. Divide all by 222. it equals 100 you are a member.

Send certified (by another ham) list of co tacts only giving complete log informatio We will check logs. Do not send QSLs. Se to Oregon Centennial Club Chairman—R. Carruthers, Jr., KN7HDB—P. O. Box 123 Warrenton, Oregon.

Contacts with Clapsop County hams cou double.

No Stations count twice.

Any wireless communication counts and a are equal.

Nothing extra for additional bands, or emi sions beyond 1 point per station.

SWLs	North America	100 loggin
SWLs	Other	50 loggin

(Tnx KN7HD

Well fellows, that's about it for this mont I'm still open to suggestions about the colum You know, I really can't write an interestin column unless I have your help, so please sen me any information you might have and get to me before the 15th of the month. CU ne month.

73 es DX, Urb, W2DE

NOVICE *[from page 79]*

with his SX-99. He would like skeds on 1 meters.

Harold A. Smith, K4JCX, 121 Maple Lan Oak Ridge, Tenn., had his Novice ticket bac in 1956 but didn't get on the air with it. Abo a year ago he passed his General and is cu rently on 80 and 40 meters CW. Harold is u ing a S-53-A with a Q Multiplier.

Believe it or not, but that's about the exte of the letters for this month. Looks as if ever one is out fishing. Think that's where I'll g CU next month.

73, Don, W6TN

CONTEST [*from page 101*]

many

A 1,003,101 1172 102 237 C
J3JZ—DL1CR—DL3AO)
L9CI—DL6EW—DJ1BP)

J

A 383,853 821 59 130 C
(DL7YU—DJ2HC)

H

A 228,123 542 57 132 B
(DLØBH—DJ2HH)
(DL9CQ—DJ1FY)

A 147,962 346 61 106 B
(DJ4PK—DJ2BW)

A 30,780 283 22 68 C
(DJ2XP—DJ1RZ)

AA

A 141,336 436 49 102 C
(DL4DY—DL1HE)
4HI—DL4AE—DL4ACZ)

gary

FR

A 170,240 678 37 96 B
2 Oprs—Club Station)

DQ

A 24,570 215 22 56 C
Oprs—Club Station)

OB

A 13,120 170 24 58 C
ulti-Oprs—Club Station)

CU

12,194 148 19 48 —
Oprs—Club Station)

NB

7 4,020 116 10 20 B
ulti-Oprs—Club Station)

mbourg

H/LUX

A 393,129 1010 51 120 B
7AK—DL9PF—DJ2KSA)

nd

E

A 181,724 621 48 133 C
-075—SP6-080—SP3-522)

A

50,820 292 22 44 C
Oprs—Club Station)

T

4 39,471 320 16 43 C
Oprs—Club Station)

B

4 13,524 138 15 34 C
(SP9TX—SP9EB)

SP8KAV

7 7,452 175 7 29 B
(SP8YA—SP8074)
(SP8126—SP8031)

Sweden

SM6BSK

A 339,072 707 60 132 C
(SM6BSK—SM6NN)
(SM6VR—SM6ANC—SM6APH)

SM2CAA

A 90,114 331 38 100 B
(SM2CAA—SM2BJS)

SM5CED

A 74,880 281 38 79 B
(SM5CED—SM6BDS)

SM5AJR

14 39,399 281 19 50 B
(SM5AJ4—SM5BUR)

SM5AB

14 34,550 276 14 36 —
(Signal Regemente)

SM7BAH

14 11,835 109 14 31 C
(SM7BAH—SM7BBN—SM7BFK)

Yugoslavia

YU2RN

7 17,996 281 11 33 B
(YU2RN—YU4UE/2)

U. S. S. R.

European

UA1KAQ

14 76,800 650 20 44 —
(Club Station)

Estonia

UR2KAE

A 52,528 334 25 73 C
(Club Station)

Ukraine

UB5KBB

A 675,840 1203 85 235 C
(Club Station)

UB5KAB

A 542,828 829 93 245 C
(Serge and Leo)

SOUTH AMERICA

Uruguay

CX3BH

A 668,964 1,062 78 136 D
(CX2AM—CX5CO—CX6AD)
(CX7CO—CX9AJ)

USA Club Scores

rth Jersey DX Assn.	**4,275,996**
omac Valley Radio Club	2,653,393
California DX Club	2,536,324
io Valley Amateur Radio Club	1,063,184
rthern California DX Club	664,440
eater S. Louis DX Club	390,678
rthern Ohio Teenage DX Club	369,426
chorage Amateur Radio Club Alaska)	351,631
chester DX Assn.	290,698
nkford Radio Club	234,477
es Michigan Amateur Radio Club	168,970
ui Amateur Radio Club (Hawaii)	48,272
rk Road Radio Club	19,963

Foreign Club Scores

ntral Radio Club, Praha (Czech.)	**2,025,766**
un Radioamatoorit (Finland)	1,156,495
XRC (Japan)	741,706
lino Radio Club (USSR)	592,301
nanski Radio Club (Poland)	318,955
tu Radio Club (Estonia, USSR)	257,130
rsaw Radio Club (Poland)	217,629

[*Continued on page 121*]

BACK
ISSUES
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For further information, check number 36 on page 126.

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ALL ARE NEW UNLESS OTHERWISE INDICATED

METERS—0-50 microamp, 2½" Burlington model 921..1# ..$4.95
0-2 amp RF, Triplet 242-T or Weston 507..1# $3.95

ATTENUATORS—
600/600 T-pad, 30 steps, Tech Lab................1#....$2.89... 2/$4.95
6000/5500 L-pad, Ohmite type AB................½#...... 59¢...... 2/95¢
500K/500K T-pad, 20 step, Daven or eq........1#....$1.45....2/$2.45

TRANSFORMERS . . . All have 115 volt, 60 cycle AC primaries
Filament, 6.3/22,6.3 ct/2.4,6.3/2.25,6.3 ct/0.6............9# $3.29
Scope, 6.3/1.85, 6.3/0.6, 700 ct/30, 525/5, 2.5/1.75,
6.3/0.6, 2 and # KV insulation, upright shielded....5# $3.45
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5FP7 ....$1.29 ppd 5GP1 ......$2.45 5JP1 ....$2.45 ppd
5JP2 ....$3.45 7BP7 ......$2.95 5FP11A ......$2.50 ppd

MISCELLANEOUS VALUES—
RA-85 pwr supply, 115/230 v, 60 cyc input; 115 volt DC
output at 400 ma. Recond. by Signal Corps..............45# $12.95
BC-1268-A radar scope with all tubes......................... 100# $16.95
10 hy/500 mil choke, 100 ohms, 2 KV RMS................30# $6.95
Delco selsyn, type II-4, C56701, 115 v, 60 cyc........15# 2/$17.95
Lo-pass filt, 300-2500 cyc, —40 db at 3200, HS..........4# $1.95
BC-684 xmtr, 27-39 MC, recond Yokahama Sig Depot 50# $7.95
BC-604 xmtr, 20-28 MC, very good used condition....50# $4.95
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Dynamotor, 6 volt input, 600 v/150 mils, Eicor....... 12# $6.95
BC-610 tuning units . . complete set $24.95 . . each 4# $3.45
Bleeder resistor, 25K ohms at 160 watts.........................1# 69¢

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2X2 35¢, $2.95/doz. 3B24... ....55¢, $4.95/doz. 3C24........$2.95
6AC7W......85¢ 6SL7GT......65¢ 6SN7GT......55¢ 6V6GTY......65¢
89Y........15¢, $1.49/doz. 221-A........55¢ 305-A... ....$1.95
RK-75......85¢ HY615......15¢, $1.49/doz. 957 .....35¢ 958A..... 35¢
1619............35¢ 1625............95¢ 1629... ....15¢ 7193............15¢

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Send adequate postage with orders We refund any overage
All prices are FOB Sacramento

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PO BOX 6188 CCC, SACRAMENTO, CALIF.

For further information, check number 37 on page 126.

HAMMARLUND
DOLLAR DAYS
MAY 15th to JUNE 30th

HQ-110 DEAL
Buy a famous, current best-seller HQ-110 (Amateur coverage) receiver at regular price of $249.00. Add $1.00 more and get clock-timer ($10 value) and S-100 speaker ($14.95). EVERYTHING ONLY
$250.00

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Same deal as above except general coverage HQ-100 receiver. Regular price $189.00, you get clock-timer and speaker with receiver for only
$190.00

$1.00 GETS YOU $24.95!

TYDINGS COMPANY
933 Liberty Ave., Pittsburgh 22, Pa.
WE WILL TRADE! TERMS EXTENDED!

For further information, check number 38 on page 126.

HAM CLINIC *[from page 87]*

100 watts SSB may only (and usually does)
have an AM rating of say only 25 watts?”

Power supply. SSB rig power supplies ar
not *usually* built for long “on cycle” operation
Class B type finals are invariably used in SS
and do not consume power without “interrup
tion” unless a steady signal is provided i.e.
two tone test. Plate dissipation must alway
be considered *first* in the design of class
amplifiers. Peak envelope power (PEP) is no
the same as the *average* AM power.

SX 28 Modifications

Thanks to *Hallicrafters* here are some mor
modifications to the old SX28 (A) receive
which will improve 10 meter operation an
(existing) noise limiter action. These change
are quite easy to make but the receiver mus
be carefully realigned after they are mad
Again, if you do not “feel up” to these mod
fications, it is suggested that you contact you
nearest *Hallicrafters* Service Agency; they'll b
glad to help you.

Add a capacitor C116 (fixed 6-6½ mm
ceramic) to top of the *rf* transformer T-1
A parasitic resistor R76 (10 ohm ½ watt
added in series with grid lead of tube V-
Tube V2 changed to a 6AB7 (1853). Add
capacitor C114 (10mmf +— 10% 500 VD
ceramic Class D) across top of *rf* transforme
T24. Screen grid lead from tube V2 is no
connected to the 280 volt lead instead of th
100 volt lead. Resistor R75 added in seri
with noise limiter lead from tube V5 (3r
grid from plate of tube V5); 100 K ½ wat
Resistor R49 removed from junction of capa
itor C111 and choke CH3. A capacitor C11
(27mmf +—10% 500 VDC mica) an
resistor R49 (27K 1 watt) is connected
parallel from the injector grid of tube V
to ground. The plate and cathode leads f
tube V10 were reversed at the tube. Th
circuit concerned includes Switch SW5-1 whic
will now be connected in the plate lead
tube V10 rather than in the cathode lead
shown in the printed circuit. Capacitor C1
connection was moved from the top of
transformer T-29 to the tap on the sam
transformer. A capacitor C117 (6-6½ mn
ceramic fixed) was added across the top
rf transformer T17. The side of *rf* trimm
capacitors C88, C89 and C90 which is co
nected to ground is now connected to th
junction of capacitor C17 and resistor C
The side of *rf* trimmer capacitors C92, C9
C94, C95 and C96 which is connected
ground is now connected to the ungrounde
side of capacitor C21. Finally, capacitor C
is now connected between the control gr

[*Continued on page 110*]

RADIO BOOKSHOP

We go through the hundreds of books on electronics and adio and select those best suited for hams. It is still possible to learn about radio, even at this late day and age. heck over the list below and let us fill in your library. eginners will want #40-13-23-24. Next step is #21-22-3-32.

1 **Electronics & Radio Eng. by Terman** $14.50
1078 pages. One of the most complete radio textbooks ever printed. All theory but not too heavy on math

2 **E. E. Handbook by McIlwain**
1618 pages. Mostly formulas, tables and circuits. With this, #13 & #32 you will have a complete source of data $10.00

5 **Antennas by Kraus (W8JK)** $10.50
The most complete book on antennas in print, but largely design and theory complete with the math

7 **SOS At Midnight by K6ATX**
Adventure story for the junior op............. $2.75

3 **Reference Data, 4th Edition**
The IT&T handbook, 1152 pages. Data, data . . $6.00

6 **Ham Register by W3VKD**
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8 **So You Want To Be A Ham**
All you need to know to get a license........ $2.50

9 **Short Wave Radio & The Ionosphere by Bennington**
As recommended by Geo. Jacobs, nobel Propagation Editor of CQ. $2.75

RTTY Handbook by W2JTP
A-Z of ham teletype, supply low, very popular . . $3.00

1 **VHF Handbook by W6QKI**
Covers just about every aspect of VHF........ $2.95

2 **Beam Antenna Handbook by W6SAI**
Practical, includes both theory and construction $2.70

3 **Novice Handbook by W6TNS**
Receiver, transmitter and antenna theory and construction for the Novice and Technician. Terrific.... $2.85

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Fine handbook for SWL'ing, long needed...... $2.85

5 **Surplus Radio Conversion Manual I**
BC-221, 342, 312, 348, 412, 645, 946, 1068A. SCR-274, 522. TBY, PE-103, etc. $2.50

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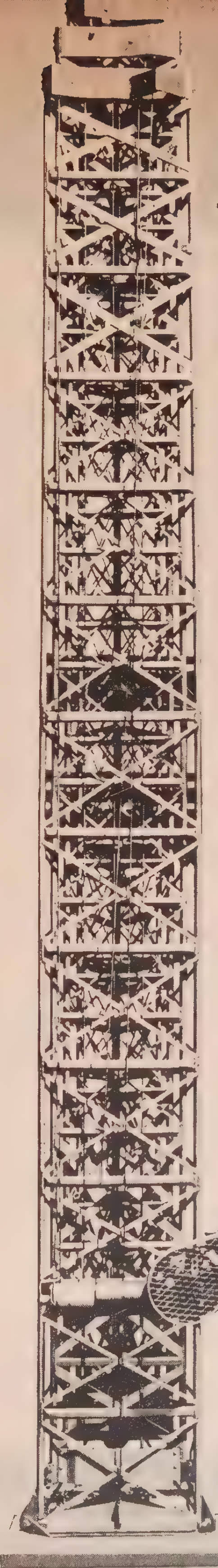
rther information, check number 39 on page 126.►



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IMPROVED
Tri-Ex TOWERS

For AMATEURS— For INDUSTRY—

Triple Coated Finish for Maximum Weather Protection!

- Iron phosphate rust-proof undercoating
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Towers may be completely motorized and remotely controlled with use of Tri-Ex Accessory Kit.

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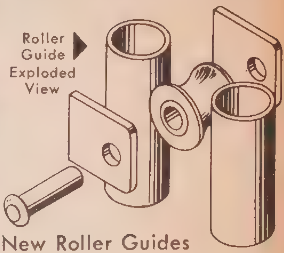
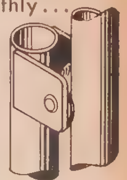


New Roller Guides enable towers to be cranked-up to extreme heights . . . smoothly . . . silently . . . easily . . .



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- TWO BAND
- SINGLE BAND

TENNALAB

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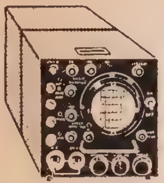
WATCH for the **Big Antenna** issue **July CQ**



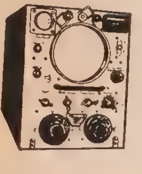
BC-929 3" SCOPE INDICATOR COMPLETE

Originally used for IFF and Radar Navigation. Can be easily converted for general bench service work. Tubes included: 2-6SN7, 2-6H6, 1-6X5, 1-6G6, 1-2X2 and 3BP1 Cathode Ray Tube. A TERRIFIC BUY at our low price!

Excellent used **$9.95**

As Above, BRAND NEW $12.95

Conversion instructions for AC operation .... .65



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Easily converted for use on radio-TV service bench.

Completely Assembled

Supplied with 5" Scope, type 5CP1 only.

LIKE NEW! **$14.95**

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SCR-274 COMMAND EQUIPMENT

ALL COMPLETE WITH TUBES

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BC-453	Receiver 190-550 KC	$14.50	$16.50
BC-454	Receiver 3-6 MC	9.45	12.45
BC-455	Receiver 6-9 MC	10.45	12.45
BC-450	3-Receiver Control Box	1.49	1.95

110 VOLT AC POWER SUPPLY KIT

For All 274-N and ARC-5 Receivers

Complete with metal case, instructions **$7.95**

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BC-457 TRANSMITTER—4-5.3 Mc. complete with all tubes and crystal. BRAND NEW **$7.85**

BC-458 TRANSMITTER—5.3 to 7 Mc. complete with all tubes and crystal. BRAND NEW **$7.85**

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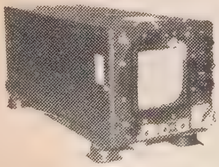
ARC-5/T-19 TRANSMITTER—3 to 4 Mc. BRAND NEW complete with all tubes & crystal **$8.85**

BC-456 Modulator .... **USED 3.45** **NEW 5.95**

BC-451 Transmitter Control Box .... 1.25 **NEW 1.49**

POWER SUPPLY KIT for All Command Sets, input 110 V 60 cy. AC. Top Quality $29.50



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BRAND NEW, including all tubes, together with 5BP1 'Scope Tube. Originally used in Navy Aircraft RADAR equipment. Easily converted for AC operation.

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11 CHANNELS

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Complete With Tubes

Navy Model Collins Autotune Aircraft Transmitter—one of the very finest! Original cost $1800. Up to 90 watts output on CW, MCW or Voice. Easily preset frequencies. Simple operation. Subassembly construction for quick repair. This is a sensational smash value at our low price. Exc. used. Limited Quantity.

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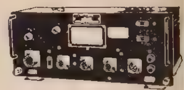

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FM TRANSMITTER-RECEIVER

420 to 460 Mc Aircraft Radio Altimeter Equipment. Complete with all tubes and original operating manual. including mount. For 27V DC operation.

OUR LOW PRICE **$9.95**
BRAND NEW

AC POWER SUPPLY for BC603, 683. Interchangeable, replaces dynamotor. No rcvr change needed. On-off switch on power supply. Provides 220V DC @ 80 Ma, 24 V AC @ 2 Amps.

Complete kit with easy instructions **$8.45**

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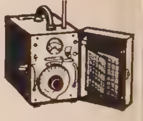

BC-906 FREQ. METER-SPECIAL

Cavity type, 145 to 235 Mc. BRAND NEW, complete with antenna. Manual incl. **OUR LOW PRICE** **$9.88**

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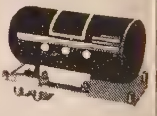
3"	150V DC Hoyt panel meter Brand New	$2.45



MOBILE-MARINE DYNAMOTOR

Input 12V DC. Output: 625 V DC @ 225 Ma. for press-to-talk intermittent operation. Shipping weight 14 lbs.

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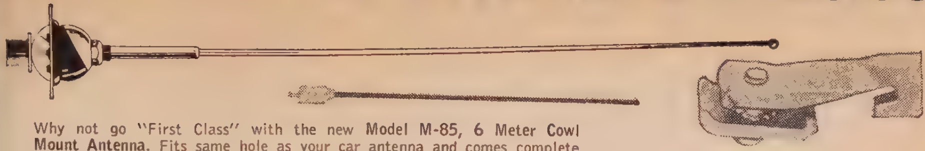
Please include 25% Deposit with order—Balance C.O.D. 50c HANDLING CHARGE on Orders under $5.00 MINIMUM. All Shipments F.O.B. Our Warehouse N.Y.C. All merchandise subject to prior sale and price change.

G & G Radio Supply Co.
Telephone: CO 7-4605
53 Vesey St., New York 7, N. Y.

For further information, check number 40 on page 126.

New—For The 6 Meter Enthusiast!



Why not go "First Class" with the new Model M-85, 6 Meter Cowl **Mount Antenna.** Fits same hole as your car antenna and comes complete with a 54" RG58/U removable cable. Whip Gutter Clip, Model M4, included **No Charge.** Has Flexible Stainless Steel Tapered Whip, 59" long, for Maximum 6 Meter Performance!

PRICE ONLY $8.97 Amount Net ($14.95 List)

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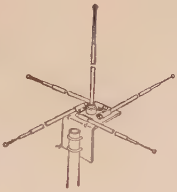
For the new 27 MC (11 meter) Citizens Band. For mobile, portable and base station use. 14 models available. (4 shown) Write for free catalog on entire 27 MC line.

M-25 Mini-Spring. Reduces shock to coil if whip strikes object **$1.98**

M-19 10-15-20 meters. Automatic coil. No adjustment necessary. Weather-proof. Compact. **$14.95**



M-22 27 mc ground plane antenna. Chrome plated brass radiator and radials are telescoping and may be removed from mounting bracket. All hardware supplied. Accepts PL-259 connector **$15.95**

ASP-185 Auto gutter clamp antenna. Ideal for temporary use. Has Vinyl covered loading coil wound for 27 MC. Complete with 12' RG58/U cable and PL-259 adaptor. 40" whip. **$15.40** complete

PIONEER

SUPERIOR 1-5277

2103CQ EAST 21 ST.
CLEVELAND 3, OHIO
DICK BRANARD K8IXN • FRED OAMAN W8PAT

For further information, check number 41 on page 126.

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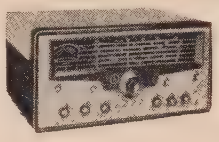
for HALLICRAFTERS

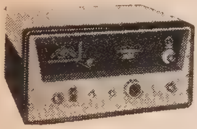
SR-34. Complete two and six meter station. Features transistorized, built-in power supply.

See Page 10, November '58 CQ for complete details.

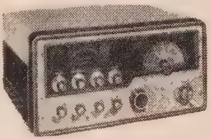
AC Power Supply.. **$395.00**
AC/DC Power Supply **$495.00**



The **ALL NEW SX-101 MARK IIIA** Hallicrafters Receiver. **Frequency Coverage:** Band 1 — 30.5-34.5 Mc Band 2 — 3.48-4.02 Mc. Band 3 — 6.99-7.31 Mc. Band 4 — 13.98-14.415 Mc. Band 5 — 20.99-21.52 Mc. Band 6 — 26.9-29.8 Mc. Band 7 — 10 Mc. WWV. Many New Features. See Pages 10 and 11, January, 1959 CQ for complete details **$399.00**



The **ALL NEW HT-33A LINEAR AMPLIFIER** from Hallicrafters. Complete coverage of amateur bands: 80, 40, 20, 15, 10 meters. For full details see Pages 10-11, January, 1959 CQ.......... **$795.00**



The **ALL NEW HT-32A** Transmitter fresh from Hallicrafters. Complete coverage of amateur bands: 80, 40, 20, 15, 10 meters. See Pages 10 and 11 January, 1959 CQ for complete details and features.......... **$695.00**

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KEN-ELS
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Fort Dodge, Iowa
Phone 5-2451
EXPORT BUSINESS WELCOMED

For further information, check number 42 on page 126.

HAM CLINIC [*from page 106*]

of tube V9 and plate of tube V8. Realig receiver.

Do the steps outlined in sequence. Mo of these changes can be made in addition those already published. Except when installi a new limiter circuit, there will be no ne to worry about V10.

Book Review

Television Interference (Its Causes a Cures) by Phil Rand is still the top book o TVI. Loaded with 10 chapters of good so information it covers everything that a ha needs to know. The chapter I enjoyed mo deals with the design and use of low-pa filters. Too bad that this book is not publish in Europe's many languages; many Europe hams just stay off the air during TV broa cast hours. I like the format of the book a the way many of the drawings are present It is understandable and does not take a pr fessional engineer to decipher its conten For $1.75, the book is obtainable from t *Radio Bookshop* 1379 East 15th St., Brookl 30, N. Y. postpaid. I recommend it for t Novice as well as the Extra Class ham.

Thirty

Arthur Egendorf Jr. (KN3GCF) of Phi delphia receives the box of parts I promis Hope that he can use what I have sent hi

We have a large number of people w wrote in relative to the need for parts a equipment, but few who volunteered to don the stuff gathering dust in the garages a attics across the nation. Perhaps there is t usual "delayed action" effect (some ha read this month's CQ thoroughly during va tions and holidays). Let us hope that th will wake up and send in a list of what th have to give away to help out those in ne

For this month, 73 and lots of DX.

Chuck, W6QLV/F7

LAND LINE [*from page 59*]

from the kitchen and the hung-up conditi with zero line current repeats. The remain condition is the *ac* ringing case where the ph acts as a parallel load device on the line.

A word of caution should be mention Telephone circuits are critical as to line i pedance, operating voltages and switching quences. In general it is not a good policy attach fancy gimmicks to the line, nor to tempt modifications of your phone for so special purpose as it is surprisingly easy to set the line balance in which case you attract almost as much attention as could gotten by dropping a kw signal on the band.

Survey Time

CQ in recent years has stayed close to the needs of radio amateurs and the problems confronting hams in buying the equipment they want. We've made several market studies which give us a pretty good idea as to what hams expect from manufactured equipment. Now we'd like your help in determining the importance the local distributor plays in your buying as opposed to the mail-order dealer. Your cooperation in answering this survey will result in better ham-dealer relations.

……

Have you bought a piece of *new* equipment in the past year?

☐ YES ☐ NO

If yes, please check the price range of this unit

☐ under $50.00 ☐ $50.00-$100.00 ☐ $100.00-$250.00 ☐ over $250.00

Did you buy this equipment through a distributor?

☐ YES ☐ NO

Have you bought a piece of *used* equipment in the past year?

☐ YES ☐ NO

If yes, please check the price range of this unit prices, same as above.

☐ under $50.00 ☐ $50.00-$100.00 ☐ $100.00-$250.00 ☐ over $250.00

Did you buy this equipment through a distributor?

☐ YES ☐ NO

If yes, may we have the distributor's name? ______________________________

____

Did you purchase this equipment by mail order or by direct visit to the dealer's store?

☐ mail order ☐ direct visit

Was this purchase the result of a particular ad on the part of a manufacturer?

☐ YES ☐ NO

Was your purchase the result of an ad by the distributor?

☐ YES ☐ NO

Other than trade factor, what influenced you to buy this equipment from the particular distributor? ______

______

______

Do you use CQ as a buying guide as to what equipment is available on the market?

☐ YES ☐ NO

Do you tend to have greater confidence in manufacturers and distributors who advertise in nationally distributed magazines such as CQ?

☐ YES ☐ NO

Do you use distributors' catalogs as a source before determining where to buy a piece of equipment?

☐ YES ☐ NO

Please list distributors from whom you have purchased ham equipment in the past five years other than those previously mentioned.

______

______

Have you any other suggestions that we can pass on to distributors in general that may better ham-dealer relations? ______

______

______

Have distributors in general strengthened your interest in ham radio? If yes, any particular reason?

______

______

______

• •

NAME______ CALL______

STREET______

CITY______ ZONE______ STATE______

RETURN TO: **SURVEY DEPT.**
CQ MAGAZINE
300 WEST 43rd STREET
NEW YORK 36, N. Y.

ARC 5 *[from page 55]*

The control system can take on many forms. Perhaps the simplest is a TPDT switch which operates the antenna relay, silences the receiver, and turns on the SB exciter. If the SB exciter has a VOX relay with enough spare contacts the antenna relay and the receiver can be controlled that way. Also an extra relay controlled by the VOX may be used.

The RK34's should be operated at 250 to 300 volts. The 832A's may be operated at plate voltages ranging from 300 to 600.

Tune Up

To make the initial tune-up remove the ground end of the grid resistor of the first RK34 doubler and insert a milliammeter with a range of about 10 *ma*. Apply plate voltage to the RK34's and adjust the oscillator tuning capacitor for a maximum reading on the meter. Disconnect the plate voltage, the meter, and reconnect the resistor. Always be sure to kill the plate voltage after each adjustment.

Put the meter in series with the ground end of the second RK34 doubler grid resistor and adjust the plate coil slug of the first doubler for a maximum reading.

Move the meter to the ground end of the 832A mixer grid resistor and adjust the plate coil slug of the second doubler and the grid coil slug of the mixer for a maximum reading. Repeat all of these adjustments with the meter still in the mixer grid circuit.

Move the meter to the ground end of the inal grid resistor. With no bias, screen, or plate voltage applied to the final, feed a 14 *mc* carrier from the SB exciter to the screen of he mixer and adjust the mixer plate coil slug for a maximum reading. Removing the 14 *mc* carrier should make the meter read zero. If it does not, the mixer plate is tuned to 130 *mc*. If this is the case re-insert the 14 *mc* carrier and tune the mixer plate higher to the next maximum. Now tune the final grid coil slug or a maximum reading.

Connect two # 47 dial bulbs across the anenna fitting and apply all voltages. Tune the inal plate coil slug and adjust the loading capacitor alternately for the highest brilliancy of the bulbs. Reduce the carrier from the SB xciter to the minimum and talk into the mike. The bulbs should flash with modulation.

The filaments of the RK34's are hooked in eries while the filaments of the 832A's are hooked in parallel. This is required because he RK34's are six volt tubes and the sockets of the 832A's do not have a connection for he filament center-tap.

Although the output of this transmitter is omparatively low, 10 to 15 watts, it will do fine job of getting out if coupled to a reasonbly efficient antenna. For those who want more power output this unit makes a good exiter for a high powered linear final. ■

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All crystals made from Grade "A" imported quartz—ground and etched to exact frequencies. Unconditionally guaranteed! Supplied in:

FT-243 holders Pin spacing ½" Pin diameter .093	**MC-7 holders** Pin spacing ¾" Pin diameter .125
DC-34 holders Pin spacing ¾" Pin diameter .156	**FT-171 holders** Pin spacing ¾" Banana pins

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9001 KC to 11,000 KC:
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FUNDAMENTAL FREQ. SEALED CRYSTALS IN HC6/U holders. From 1400 KC to 4000 KC. .005% tolerance **$4.95 ea.** From 4000 KC to 15,000 KC any frequency .005% tolerance **$3.50 ea.**

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30 to 45 MC .005 tolerance .... **$4.10 ea.**
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AIRCRAFT CRYSTALS in HC6/U holders from 118.1 MC to 123.9 MC .... **$3.85 ea.**
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SUB-MINIATURE AIRCRAFT CRYSTALS ALL FREQUENCIES .... **$6.75 ea.**

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Following frequencies in stock (frequencies listed in megacycles) 26.965, 26.975, 26.985, 27.005, 27.015, 27.025, 27.035 27.055, 27.065, 27.075, 27.085, 27.105, 27.115, 27.125, 27.135, 27.155, 27.165, 27.175, 27.185, 27.205, 27.215, 27.225

FT-241 Lattice Crystals in all frequencies from 370 KC to 540 KC (all except 455 KC and 500 KC) **50c ea.**
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455 KC Crystals .... **$1.50 ea.**
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Dual socket for FT-243 crystals .... **15c ea.**
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For further information, check number 43 on page 126.

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RECEIVER HQS.

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6AL5	.65
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6AS7G	3.25
6AS8	1.15
6AT6	.50
6AT8	1.15
6AU4GT	1.15
6AU5GT	1.50
6AU6	.75
6AU8	1.20
6AV6	.60
6AW8	1.25
6AX4GT	.90
6AX5GT	1.05
6B4G	3.50
6BA6	.70
6BC4	1.80
6BC5	.80
6BC8	1.40
6BE6	.75
6BG6G	2.25
6BH6	.75
6BJ6	.70
6BJ7	1.00
6BK4	2.50
6BK5	1.10
6BK7A	1.15
6BL7GT	1.35
6BN4	.85
6BN6	1.00
6BQ6GT	1.50
6BQ7A	1.35
6BS8	1.45
6BU8	1.00
6BX7GT	1.35
6BY5G	1.15
6BY6	.80
6BY8	.90
6BZ6	.80
6BZ7	1.40
6BZ8	1.60
6C4	.45
6C6	.75
6C21	12.50
6CB5	2.75
6CB6	.80
6CD6G	2.25
6CF6	.90
6CG7	.85
6CG8	1.10
6CL6	1.30
6CM6	.90
6CN7	.85
6CS6	.85
6CU5	.90
6CU6	1.50
6D6	.75
6DE6	.85
6DT6	.85
6DQ6	1.55
6F4	2.25
6F6	.90
6F7	.95
6F8	1.25
6H6	.45
6J4	1.00
6J5GT	.55
6J6	.50
6K6GT	.80
6K7	.75
6K8	1.00
6L6	2.00
6S4	.75
6SA7GT	1.05
6SC7	1.05
6SJ7	.75
6SK7GT	.90
6SL7GT	.90
6SN7GT	.70
6SN7GTB	.90
6SQ7GT	.85
6T4	1.30
6T8	1.15
6V6GT	.75
6W4GT	.85
6W6GT	1.00
6X4	.60
6X5GT	.79
6X8	1.10
6Y6G	1.00
7BP7	5.00
8AW8A	1.40
8CG7	.90
8CM7	.90
12A6	.40
12AE6	.65
12AD6	.75
12AT6	.70
12AT7	.85
12AU6	.75
12AU7	.85
12AV7	1.10
12AX4GT	.95
12AX7	.85
12AY7	1.25
12B4A	.90
12BA6	.70
12BE6	.75
12BH7A	1.05
12BK5	1.20
12BQ6GTB	1.55
12BY7A	1.00
12BZ7	1.05
12CU5	.85
12CU6	1.55
12DQ6	1.55
12SA7GT	.95
12SC7	.85
12SK7GT	.95
12SL7	.75
12SN7GT	.90
12SQ7GT	.85
12SR7	.65
12V6GT	.75
12W6GT	1.00
12X4	.60
15R	.20
FG17	5.00
19AU4	1.20
19BG6G	2.25
24G/3C24	3.50
25AX4GT	1.05
25BK5	1.25
25BQ6GT	1.55
25CD6GA	2.00
25CU6	1.60
25L6GT	.70
25W4GT	.95
25Z5	.65
FG27A	7.50
FG32	4.50
35A5	1.00
35B5	.90
35C5	.75
35L6	.85
35TG	1.75
35W4	.50
35Y4	.80
35Z5	.65
50A5	1.10
50B5	.90
50C5	.75
50L6GT	.85
RKR-72	.25
80	.85
81	1.75
83	1.35
100-TH	9.50
VXR130	1.00
4X150A	7.00
274B	.40
GL-299	1.00
307A	.50
310-A	3.50
311A	3.50
316A	.20
337-A	2.75
339A	5.95
350A	2.00
350B	1.50
357A	15.00
371B	1.00
394A	3.00
396A	2.00
401A	1.50
403A	.90
403B	2.40
404A	7.00
407A	2.95
408A	1.75
417A	8.00
420A	6.75
434A	4.00
446A	.50
450-TL	43.00
673	11.50
703A	.75
TR-722	.90
723A/B	5.00
803	1.50
805	3.50
806	7.00
807	1.15
807W	1.50
809	3.00
811	3.50
811A	5.50
812A	5.50
813	8.50
815	3.00
816	2.25
826	.60
829-B	8.00
830-B	.25
832	3.75
832-A	7.00
837	1.00
838	1.00
866A	1.50
872-A	1.25
879/2X2	.25
884	.70
885	1.00
889RA	75.00
918	.85
954	.10
955	.20
957	.20
958-A	.25
991/NE16	.15
1613	1.50
1614	2.75
1616	.60
1619	.17
1625	.20
1626	.15
1629	.30
1635	2.00
1654	1.70
1852	.75
2013	.50
2014	.50
2050	1.25
ZB-3200	45.00
5516	7.00
5517	.70
5528	4.00
5557	5.00
5558	4.00
5559	5.00
5563-A	35.00
5588	35.00
5636	2.25
5637	2.50
5638	2.50
5639	2.95
5642	1.50
5651	1.00
5654	1.50
5656	3.00
5667	75.00
5670	1.00
5687	1.50
5691	4.50
5692	4.95
5693	4.50
5703	1.00
5704	1.00
5718	1.00
5719	1.00
5725	1.00
5726	.70
5727	1.50
5736	85.00
5744	.80
5749	.85
5750	1.75
5751	1.35
5812	1.50
5814	.75
5814A	1.35
5840	2.00
5875	1.00
5879	1.00
5881	2.75
5963	1.00
5965	.90
6004	.85
6005	1.50
6012	3.40
6072	2.50
6073	1.00
6080	3.50
6096	1.00
6100	1.75
6146	4.50
8012	.50
8020/100R	2.00
AX9903	17.50

SEE TERMS ON OTHER PAGE

BARRY ELECTRONICS CORP.

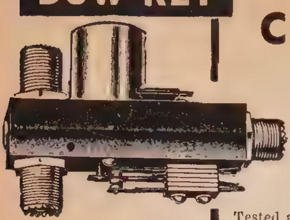
512 Broadway, Dept. 6C ● New York 12, N. Y.

For further information, check number 44 on page 126.

DOW-KEY

Silent COAXIAL RELAY

GUARANTEED FREE OF HUM OR CHATTER



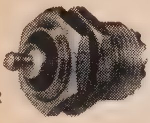
DKC-GE

Power consumption, AC models Approx. 4 watts, DC models 3 watts. V.S.W.R. at 150 mc 1.1 and 1.2 at 300 mc. Coil voltages: AC 6, 12, 24, 115, 220; DC 6, 12, 24, 48, 110, 220. Special coil voltages available.

Tested and proven by amateurs and industrials. High contact pressures now made possible with new Dow-Key magnet principle, a new concept of low resistance contact, a new high standard for coaxial relays. Exclusive, patented receiver protecting connector, and heavy duty SPDT or DPDT switches are optional.

PRICES .... 10.90 to 14.20

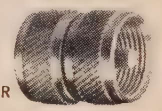
DKC-P PANEL MOUNT UHF CONNECTOR



Needs only one ⅝" hole, no screws. Precision made, durable.
Each .... 70¢

See your electronics dealer, or write for specifications.

DKF-2 DOUBLE-MALE UHF CONNECTOR



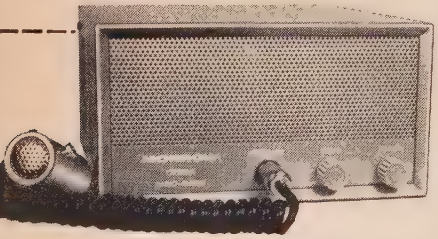
A favorite for relays, antenna switches, cables. Durable, silver-plated, locking type.
Each 1.45

Traditional factory warranty for unit replacements.

DOW-KEY CO. INC.
THIEF RIVER FALLS, MINNESOTA

For further information, check number 45 on page 126.

At Your Dealer's Now!



the NEW MORROW CITIZENS' RADIO-PHONE

A Complete 2-Way Radio Station

- ★ Noise-balanced squelch circuit.
- ★ Crystal-controlled transmitter and receiver.
- ★ 3 MODELS—115 V., A.C.—6 V., D.C.—or 12 V., D.C.

$149^{50}

See it today at your dealer's, or write us at

MORROW Radio Mfg. Co.
P. O. BOX 1627 • SALEM, OREGON

For further information, check number 46 on page 126.

FOR SALE (cont'd)

HAMMARLUND HQ-110C in absolutely perfect condition. Used only 24 hours total. Compare the price! Only $185.00. Ron Swonger, K1CPN, 19 Perkins Road, Winchester, Mass.

FOR SALE: NC 183 with matching speaker, $150.00. Johnson Ranger, $150.00. B&W-matchmaster, $35.00. QS Hoshal, W5CHM/3, 48 Hydrangea Rd., Levittown, Pa.

19" BLOND 56 Model color TV that won't work $100, clean HQ14OX $175, DX100, good assembly $185, 2 motorola mobile 30-50 Mc 100 watt FM Xmtrs 25 ea., 600 volt at 240MA. 6 volt Dynamotors $6.00, 185 v out 6v in vib. supplies $5, Pair Bendix 2 meter FM pak-sets $125, Much used portable tape recorder $45, Brand new Mpls. Honeywell fire alarm installation for 14 room house $95.00 including outside roof alarm. W9DSV Box 87, Webster, Wisc.

PEERLESS 650 watt multimatch new $42.00. Pair Eimac 4-250-A $21.00 each with sockets. BW CX49A with HDVL coils $25.00. COLLINS 75A3 perfect $385. W. Wehe W6VZB/WA6CXE 16080 Cambrian Dr., San Leandro, Calif.

DX-100, $170; SX-99, Q-multiplier, VOX, $170; whole works, $325. Write Chaz, Box 1829, Georgia Tech, Atlanta, Georgia.

HAM SHACK: Includes HQ-129-X, DX-35, AR-22, powe supplies, ARC-5's and much more. For list write M. Pedersen, 3550 Paradise Dr., Tiburon, Calif.

SELLING: SX-100 with HQ speaker. Like new condition $215.00. Joseph Marshall, Jr., 22 Clare Drive, East Northport, L. I., New York.

FOR SALE: Collins 30K-1 500 watt transmitter and 310 A exciter. Excellent condition. $700.00 or make offer o swap for Collins 32V3 or 75A3 plus cash. Write to: Fran Estis Jr., R.R. #3 Box 81, McHenry, Ill.

MOBILE ANTENNA: best made Webster bandspanne 80-10 for full information write to: Ed's Radio & T.V. Box 83, Oxford, Nebraska.

COLORADO HAM DIRECTORY—Over 2,000 amateur cross indexed by call, name, QTH with phone numbers 64 pages. $1.00 postpaid. Denver Radio Club, Inc., P. O Box 356, Denver 1, Colo.

CLEANING HOUSE—Bargains in tubes, plate an modulation Xformers. 813, $6; 4-125, $10; 4-65, $7.50 Complete list on request. Claude Brown, Box 1208, Dalhart, Texas.

NEW AND USED, surplus parts, and equip. Send fo free list. D. Reed Co. 1604 Grange Ave. Racine, Wis.

SEND your favorite photo to a brother ham as a photo stamp pasted on your letterhead. Send photo and $2.0 for 100 ¾ by 1" or 50 1 by 1½" stamps. Photo returne Clyde Kellogg, Dutch Flat, Calif.

FOR SALE: Hallicrafters S-107. Brand new in origina carton. Price $70.00. Charles Ehlers, 319 Union St., Jersey City, N.J. Phone HE 2-2145.

CANADIANS—KWS—1 Complete commercial grade power supply $1250.00 VE2JS, 78 Dahlia Ave., Dorva Quebec.

FOR SALE: Eico HVP—2 $3; HV probe for Simpso 269 $3.25; Precision TV-2B $7; All brand new in origina cartons. Eico #322 New $13.00. Turner Mod 808 ori carton $4; Gonset 2M preamplifier $12.00. Philip Lerne 73-12 35 Ave., Jackson Hgts. 72, N. Y.

MOTOROLA 2 meter FM crystal controlled transmitte and receiver. 30 watt output, power supply. Can shi from Michigan or California. All inquiries answere Make offer. Larry Smith, W8OBZ/6, 325 Mathilda, Sunnyvale, Calif.

FOR SALE: Excellent Viking II factory wired Johnso VFO match box SWR Bridge $200.00. Louis Haye W9BWV, 826 N. Ridgeland, Oak Park, Ill.

KITS ASSEMBLED; 75A4 Plug-in I.F. Transformer $ surplus our lab, art—13 $35.00, SCR522 $20; BC221 $3 BC779B $50; RA74D $20; Trendtronics, 1473 Fairfiel St., Mobile Alabama.

AGAIN! *The Last Word in VHF ANTENNAS... First from RADIO SHACK!*

New! ALL-WEATHER HALO

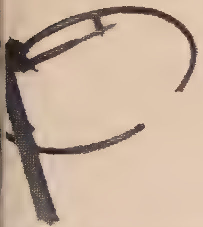
FOR MOBILE 6 METERS

Hy-gain's latest marvel won't let rotten weather shut you in! Resonating capacitor is weather-sealed in polyethylene assembly. Perfect match to 52 or 72 ohm coax without external matching sections. Highest stability. Minimum wind resistance.

Order By Mail: No. 29D789 Sh. Wt. 8 lbs.

$12.95

hy-gain



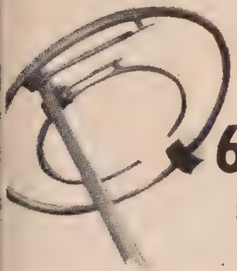
2 METER HALO

FOR MOBILE MOUNTS

Hi-strength (½" aluminum), very light (under 1 lb.), adjustable over entire 2M band. Up to 15 db. gain over vertical whips if working with like stations.

Order By Mail: No. 29D790, Ship. Wt. 6 lbs.

$5.95



Duo-Band 6 & 2 METER

Order both 2M & 6M Halos to form hi-efficiency Duo-Bander. Operate either band with single feedline, low SWR. Assembles easy.

SEE MORE OF THE WORLD'S BIGGEST HAM & HI-FI BARGAINS!

24 Page Bargain Circular

YOURS FREE!

- Ham Gear
- Hi-Fi
- Parts
- Records, Tapes
- Electronics
- Tools

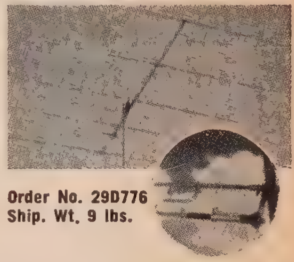
RADIO SHACK CORPORATION

167 Washington St., Boston 8, Mass.
730 Commonwealth Ave., Boston 17, Mass.
230-240 Crown St., New Haven 10, Conn.

OVERSEAS HAMS!

We've Arranged To Ship Hy-Gain Antennas Via Your APO. Order Goes Out Same Day Received.

6 METERS 5 elements 9 db GAIN



Parasitic elements are ⅛" 6061T6 aluminum for high Q, top efficiency. 9 ft. ¾" heavy wall aluminum boom. Stackable for more gain. Net wt. 9 lbs.

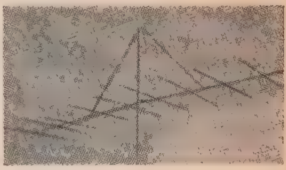
$15.95

Order No. 29D776 Ship. Wt. 9 lbs.

GAMMA MATCH

1ST TIME EVER! A perfect 1:1 SWR. New G.M. assembly is the secret. Coax connector for 52 ohm feed.

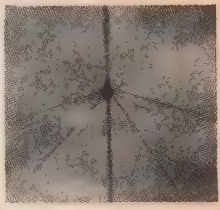
2 METERS 10 elements 13.4 db GAIN



12 ft. boom. Net wt. 3¼ lbs. Hairpin dipole matching system. Perfect 200 ohm match for K 200 low-loss parallel line or 52 ohm coax thru ½ wave balun.

$12.95 **Order By Mail: No. 29D791, Ship. Wt. 5 lbs.**

VHF VERTICAL



New design produces low SWR ¼ wave resonance, hi-efficiency both bands. 5' overall ht., net wt. 24 oz. 52 ohm coax feed, 2-band tubing ground plane.

$16.95 **Order By Mail: No. 29D782, Ship. Wt. 7 lbs.**

ORDER BY MAIL

RADIO SHACK CORP. Dept. 6C
730 Commonwealth Ave., Boston 17, Mass.

Please send me:

☐ 6M Halo (#29D789)	$12.95
☐ 2M Halo (#29D790)	5.95
☐ 6M 5E (#29D776)	15.95
☐ 2M 10E (#29D791)	12.95
☐ VHF Vertical (#29D782)	16.95
☐ Free Bargain Circular	

☐ Check ☐ Money Order ☐ C.O.D.

Name ____________________

Address ____________________

City ____________ Zone ______ State ________

For further information, check number 47 on page 126.

COMPLETE RADIO STATION

A complete portable or stationary station with accessories, in field chest. XMTR: 9W CW/3W AM. 2 Mc-4.25 Mc. VFO or XTL. RCVR: 2-8Mc in 3 bands. Ideal for field day or emergencies, and for Ship-to-Shore. New, hand gen. tubes, spares, mike, headset, antenna, etc. PLUS EL-2 Power Supply for operating Rcvr from 115 vac **$59.50**

400 MC. RADAR GOOD FOR SCHOOL INSTRUCTION

an RF altimeter for high altitudes. Freq. range 420-525 mc. Uses PP 8012's in final stage (about 25 watts average power). Ideal for conversion to amateur (420) or citizen's band (460 mc). Also ideal for use by CD units for detection of low flying aircraft close by. All units are new, including all tubes: Transmitter, receiver, antennae, indicator, control box 28 volt, everything but 2 cable assemblies. Shipping weight approx. 160 lbs.
Orig. Govt. cost $2,000. A fabulous buy only........ **$39.50**

BC 191 TRANSMITTER: Tunes 200-18,000 kc by means of 6 tuning units. Output 100 Watts AM-CW-MCW. Requires 1,000 vdc @ 350 ma/28 v. AC-DC @ 5 A. New complete with all tubes and one tuning unit........**$19.50**

BC 645 TRANSCEIVER: Ideal for conversion to ham band or citizen's band (420-465mc), New, complete with dynamotor, all tubes, and 12vdc dynamotor. (See Dec. '56 CQ Mag) ....**$32.**

COMPLETE XMTR-RCVR: Rcvr: covers 198-13.750 kc. Xmtr spans 2,000-4525 kc and 6,000-9050 kc AM-CW, 15 Watts out. New, complete with all tuning units, plugs, junction and control boxes, and instruction book. Free schematic on request. Shpg wt. 125#........**$32.50**

UNDER WATER HYDROPHONE: Navy Model JR. Consists of 20 barium titanate cylinders encased in rubber, waterproof sheath, 46 inches L. and 3 In. diam. Can be used to depths of 1,000 ft. Freq. response: 280-15,000 cps. Output impedance is 150 ohms. May be fed into any hi-gain audio amplifier for detecting schools of fish, undtrwater communications, etc. Shpg wt. 16 lbs. **$22.50**

All prices are FOB Brooklyn, N. Y.
Send deposit 25%, bal. & shipping charges COD.

COMMUNICATIONS EQUIPMENT CO.
343 CANAL ST., NEW YORK 13, N. Y.
CHAS. ROSEN Phone: CAnal 6-4882

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For Sale (Contd.)

HAMMARLUND PRO 310 Receiver, factory reconditioned—make offer! Will consider as part payment on good 32V3. Doug Stowe W6QWJ, 2553 Nipomo, Long Beach, Calif.

FOR SALE: Cash and carry deal. K, W Xmtr. C W and A M. Viking driver, P.P. 250th final, p.p. 810 modulators, 2 power supplies. No reasonable offer refused. Inquire: W2NUT.

GOING DSB: Must sell DX-100. Eleven months old. Operates and looks like new. Used very little. $160. W6WEB, Box 594, Sonora, Calif.

COLLINS S Line 1 75S1-1 32S1 with matching AC pwr. supply. Make offer! Like new. Hobe Withers, Somerset, Kentucky.

ALUMINUM for every ham need. Write to Dick's, 62 Cherry Ave., Tiffin, Ohio for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

COAX—New surplus—RG-54ALL—58 ohm impedance—30′ prepaid $1.00—Bob Farmer, Plainview, Texas.

TOWER, self supporting 65′ crankup all steel, turn antenna from ground with 15 meter WRL beam $100.00 standing. Globe scout 65 A mint $50.00. Gonset mobile, commander Xmtr, Gonset VFO, Super Six converter, Janes Power supply, with whip coil, TR switch first $150.00. Hallicrafters 2 meter Rcve. $35.00. Heath 5″ Oscilloscope with voltage calibrator $40.00. Outboard 'S' Meter $5.00. Tuning Unit Type CAY, range 'C' Freq 1500-3000kc. Radio Compass Unit BC-33-F with Alternator. Leland Motor Alternator. 13V input, 115v out at 1.55 amp. All at best offer at QTH. Ken Foshay WIFBD, RD4, Danbury, Conn.

CRYSTALS: SSB filter crystals, FT-241-A all channels matched to 15 cycles $1.00. "SSB Packages" sets of 5 fundamental mixer crystals per June 1958 QST Mobile Handbook, FT-243 $8.95, HC-6/U hermetic holder $11.95. "SSB Package" matched low and high frequency KWM-1 conversion crystals available. FT-243 Novice—general, .01% tolerance anywhere between 3500 and 8600 kilocycles $1.00. Add 5 cents per crystal for mailing. (9 cents airmailing.) Write for lists. Bob Woods, GI 8-3139, 2164 Parkway, El Monte, Calif.

67′ COMMERCIAL heavy galvanized hinge base tower. 10′ sections, suitable for heaviest beams, accommodate prop-pitch motor. Complete with galvanized guys and insulators. F.O.B. my QTH. Will ship anywhere. Highest offer buys. W3ITW, 39 High Street, Pottstown, Pa.

RECONDITIONED EQUIPMENT: NEW GUARANTEE! Mobile the inexpensive WRL way! Super-6 $39.50; G-66 $149.00; Communicators $125.00 up; TBS 50's (specify low or high impedance microphone) $67.50; Viking mobile $79.50; MBR-5 $159.00; MB560 $159.00; A54H $85.00; AF67 $139.00; PMR6A $79.00; PMR7 $119.00; ATC-1 $59.50; MC-55 $38.50; SRT-120 $99.00; power supplies $5.00 up. Tons of fixed station equipment! DX35 $52.50; VF-1 $19.95; Q multiplier $8.95; Pacemaker $385.00; 6N2 $129.50; Scout 65A $69.00; Scout 680 $84.50; Chief 90 $44.50; Champion 300A $399.00; King 500 $425.00; 755 VFO $44.50; King 500B $599.00; plus HUNDREDS of receivers. Terms, trials, trades. Leo, W0GFQ. WRL, Box 811, Council Bluffs, Iowa.

CRYSTALS AIRMAILED: New crystals. Novice, net, SSB, Citizens MARS, etc. FT-243 custom finished to .01%. Any kilocycle 3500 to 8600, 99¢. Hermetics $1.95. 1700 to 21, 500 FT-243 $1.95. Hermetics $2.50. Airmailing 9¢ per crystal. Marine .005% all frequencies $2.95 specify pin dimensions. SSB Crystals for "Package" June 1958 QST, fundamental mixer sets $8.95, matched filter sets $6.90. Get KWM-1 conversion crystals here. Let's hear about your crystal requirements we have them all. Crystals since 1933. C-W Crystals, Box 2065C, El Monte, California.

FOR SALE ** SACRIFICE!! Johnson Viking II and Heath VFO, $130.00. HQ-140-X, $170.00. Bud Low Pass Filter, $10.00. CDR Rotor with 100′ cable, $20.00. 15 Meter Beam, $20.00. Speaker and Cabinet, $10.00. Sonar phone patch, $5.00. Total, $365.00. Will sell separately or the first $325.00 takes all. Jeffrey Lehman, K2GQX, 25 Salem Road, Roslyn Heights, Long Island, New York MAyfair 1-2303.

FOR SALE (cont'd)

ARGAIN ON BOOKS, New condition. MIT Radiation ab series, #1 Radar, #4 Loran, #13 Propagation, #25 ervos. Worth $29. Special $15. Kraus Antennas $4, chelkunoff & Friis Antennas $5, Henney's Radio Eng. andbook 4th Ed. $7, Radio Aerials by Moulin $6, Skilling lect. Xmission Lines $5, Hund's S. W. Radiation Phen., ols 1 & 2, worth $20, Special $11. Complete lot for 45 postpaid. c/o Box 88, CQ.

ARGAIN. Eldico AT-1 Antennascope, new condition 13; Millen 90651 Grid Dipper 1.7 to 300 MC, new condx, 33; both for $43 postpaid; Hallicrafters R46 speaker nd cabinet $10, good condx; ATR Inverter type 6T-HSH, V DC input, 125-150 watts out at 100V AC with 2 pare vibrators, worth $130, going for $30 postpaid, new ondx; Gonset model 3128 12-volt pushbutton shortwave onverter, new condx, $17; Gonset 3-30MC SW Converter, ood condx for 6/12V, $28; James Mobile Power Supply odel C-1050 6/12V in. 500V/200 ma & 275/100ma out ew condx, $30. RCA compact portable tunes 550 kc to 2 mc, model 36QP, good condx, $18. Entire lot, $160 ostpaid. c/o Box 73, CQ.

IKING RANGER for sale. Very good condition, factory ired, new set of tubes. Prefer buyer vicinity Washington, .C. G. Jacobs, W3ASK, 607 Beacon Road, Silver Spring, d.

WANTED

ANTED: All types of communications receivers, transmitters, test equipment, teletype equipment, factory built mateur gear. Cash or trade for NEW HT-32, Valiant, hunderbolt, SX-101, NC-303, Fisher HI-FI, etc. Write om. W1AFN. Alltronics-Howard Co., Box 19, Boston 1, ass. (RIchmond 2-0048) Store: 60 Spring St. Newport, R. I. (VIking 7-3435, Fred, W1JFF)

ANTED: TELETYPE TG-7 and Model 15 and parts, rinters and reperforators, etc.; COMM'NS REC'V'RS ND XMTRS, e.g. BC-610-E, -I, BC-939A, Collins 51J, 7L3, -4; R-388 and R-390/URR; 18S-2, -3; ARN-14 and 30; APR-9, -10, ARC-21, 27, etc.; APS-31, -33; and TEST QP'T, with TS- or I- prefix. We pay freight. AMBER NDUSTRIAL CORP., 75 Varick St., N. Y. 13, N. Y.

OS-HEY OLE Jim, K6HQ needs some 304TL or TH's or new final and spares. Send one or a dozen and ame your price (don't rob me) 73 CU-SSB. K6HQ, 5208 altimore St., Los Angeles 42, Calif.

ANTED: Ham over 21. Teach radio., N.H. private oys' Camp. 32nd season. Write: 5H, 35 Davenport, New ochelle, N. Y. NE 2-7234.

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ANTED: Instruction Manual for Collins 32-V-3 transmitter. John Stack, Box 135, Mesquite, Texas W5QQY.

ANTED: Early Radios, Atwater Kent, Crebe, etc. Cash r trade. Giganti, 2429 San Carlos, San Carlos, Calif

ANTED: Used transmitter, receivers, teletype test quipment in trade for NEW Johnson, Hammarlund, allicraftrs, National, Fisher HI-FI, Bell, Telrex, Mosley. Write: Tom, W1AFN, Alltronics-Howard Co., Box 9, Boston 1, Mass. (RIchmond 2-0048)

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SL's: Samples, dime. Print Shop, Corwith, Iowa.

ubber Stamps for hams, sample impressions, W9UNY, . W. Hamm, 542 N. 93, Milwaukee, Wisconsin.

SL's-SWL's: High quality, reasonable prices. Samples. ob Teachout, W1FSV, 204 Adams Street, Rutland, ermont.

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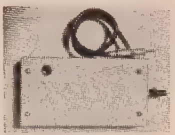

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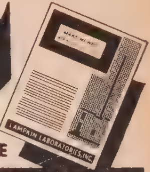

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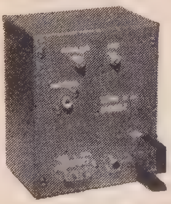

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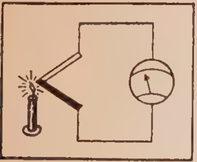

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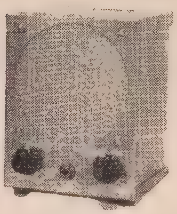

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SEE PAGE 111
WATCH FOR THE
JULY ISSUE
(ANTENNAS)

QSL (cont'd)

QSL's, SWL's, VHF's, XYL-OM's. (Sample assortment approx. 9¾¢.) Covering designing, planning, printing, arranging, mailing, eye-catching, comic, sedate, fatabulous. DX-attracting, prototypal, snazzy, unparagoned, cards. Rogers K0AAB 737 Lincoln Ave., St. Paul 5, Minn. Also glamorous, pulsating, super-passionate. (Wow!)

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CREATIVE QSL AND SWL CARDS. Are you proud of your card? If not, let us print your next order. Write for free booklet and samples. Personal attention given to all requests. Bob Wilkins, Jr. Creative Printing, KN6ZMT, P.O. Box 1064C, Atascadero, California.

QSL's??? LARGEST variety samples 25¢ (refundable) CALLBOOKS (summer) $5.00. Rus" Sakkers, W8DED Holland, Michigan.

Gospel QSL's and Ham Gospel tracts. Samples 10¢. You best contact. Sackers, W8DED, Holland, Michigan.

QSL's—SWL's: Samples 10¢. Bolles, 7701 Tisdale, Austi 5, Texas.

QSL's—"Brownie" W3CJI, 3110 Lehigh, Allentown, Pa Samples, 10¢, with catalogue, 25¢.

QSL SAMPLES, Dime, refundable. Roy Gale, Waterford Conn.

QSL's-SWL's; $2.75 per 100, QSO file cards $1.00 pe 100, Samples 10¢. Rusprint, Box 7507, Kansas City 16 Missouri.

QSL's, SWL's. Samples 10¢. Onondaga Press, Onondaga Michigan.

QSLs. Samples Free. Phillips, W7HRG, 1708 Bridge Street The Dallas, Oregon.

QSL's: Get the Best From DX. Samples 25¢ DX Car Company 2 Kulik Street, Clifton, N. J. Shop Telephon GRegory 3-4779 Residence Telephone GRegory 1-7885.

SWAP OR SELL

RADIO MAGAZINES. Buy, sell, trade. Bob Farme Plainview, Texas.

Heathkit, Bought Sold, Traded W0DVN, Box 593 Kansas City 11, Mo.

SELL OR TRADE: Navy surplus RBM-3 equip. Revr #1 200 kcs to 2 mcs, Rcrv #2, 2 mcs to 20 mcs. Complet with A. C. power supplies, Control box and connectin cables & plugs, like new, $125; HQ-129X rcvr plus match ing speaker, $100; Viking ranger with Match-Box, $15 RAX-1 rcvr, $15; RAX-2 rcvr, $15; RAX-3 rcvr, $1 All rcvrs operating & like new. Write: K2CIP. Leo W Schubert, 44 Stanwix St., Brooklyn 6, N. Y.

WILL TRADE Monroe Electric Calculator and Cortin German Language Course for good communications re ceiver, M. R. Dalessandro, 1917 Haywood Street, Farrel Pennsylvania

"HAM TV Equipment bought and sold, traded. A Denson, W1BYX, Rockville, Conn."

MISCELLANEOUS

FIFTH ANNUAL Syracuse VHF Roundup, October 1 1959.

PRESERVE YOUR HAM TICKET, Social Security Car small photo, passes and anything else of value that wallet size. We will laminate it in clear plastic, guara teed for life. Lamination will prevent it from getti torn, soiled or frayed. Send your ticket or anything value with $1 in stamps or cash for each item that y want preserved. 24 hour service. Send to Dept. HW, C Magazine, 300 West 43rd St., N. Y. 36, N. Y.

MISCELLANEOUS (cont'd)

DECORATE YOUR CAR WINDSHIELD WITH YOUR CALL LETTERS. Attractive 1" letters and numbers available in gold or black. Complete single set 75¢, two sets for $1.25. Include name, call, address and color preference. Money refunded upon return of unused decals if not satisfied. All orders must be prepaid. Send to Box RJ, c/o CQ Magazine, 300 West 43rd St., N. Y. 36, N. Y.

TWO COLOR CERTIFICATE. Attests to tongue-in-cheek ownership of one acre of the moon. Ideal gift or for wall of club, shack, bar or room. Name and call inscribed free. $1.00 each, 6 for $5.00. Box G, 1738 201 St., Bayside 60, N. Y. Check or M.O. only.

PROSPEROUS, well established, marine electronics business, sales and service now at peak. Located in fast-growing Northwest Florida, serving some 300 boats. Your chance to move to Sunny Florida. Selling only because of illness. Wonderful opportunity for man with license and some cash. James Electronics, 308 West 6th Street, Panama City, Florida.

HAMS, Calculus Lessons, First Four $1, Easy, Practical, Mathco, 4256-5 Minmor, Cincinnati 17, Ohio.

ANNUAL WYOMING HAMFEST July 25-26. Ham vacation in the beautiful Big Horn mountains. Information, W7QPP, 362 E. Loucks St., Sheridan, Wyoming.

QST BACK COPIES WANTED on exchange basis. We have in our files fairly good copies of the following old issues of QST which we will dispose of: January, 1940, September, 1941, September, 1942, June, 1943, February, March, April, May and September 1946, February, March, April, May, June, September, October and November, 1947, February thru December, 1948, January thru December, 1949, January, February, April May, June, July, August, Sept., Oct., Nov., Dec., 1950, Sept., Nov., June, 1952, February, June, July, Nov., 1953, March, 1954, March, April, June, Aug., Oct., Nov., Dec., 1955, January, June, August, November, Dec., 1956, January, Feb., April, June thru Dec., 1957, Feb., April, June, Aug., Sept., Oct., Nov., Dec., 1958. We need for our files, the following old issues of QST that are in good enough condition so they can be put into our library. July, August, Oct., 1938, February, March, 1939, May, Nov., Dec., 1943, March thru August and Oct., 1944, June, 1946, April, 1951, August, Sept., 1953, May, 1954, Sept. 1956, March, 1957. If you have any old QST copy we need and we have an old QST copy you want we'll swap with you on an even-stephen basis, or we'll buy your QST copy for 50¢ each. On the other hand, our surplus old QST copies are for sale at 50¢ each. Box T777, c/o CQ MAGAZINE. 300 W. 43 St., New York 6, N. Y.

CW CONTEST [*from page 105*]

Lucerne Section USKA (Switzerland)	203,154
Wrockaw DX Club (Poland)	136,919
Gdansk Radio Club (Poland)	105,188
Hong Kong Amateur Radio Transmitting Society (Hong Kong)	27,490

Our thanks to the following stations for sending us their logs for checking purposes.

V2KVL
V2LNB
V3GKY
V3VRJ
V4EEO
V6FKZ
V7EJD
V9RMQ
K0GPF
V0VAF
V9RQM

DJ3XK
EA8CF
G2XG
G2ZR
JA1BCQ
PJ2CJ
OH2GJ
OK1AMS
OK2KFK
OK1GS
W2WZ

OK1JX
OK1MG
SM5ANN
SM6PF
SM7CKJ
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VU2JA
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73, Frank, W1WY

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DC POWER SUPPLY—Input: 115V-60Cy. Output: 14VDC, 3A Filtered, Relay Control, in Metal Chest. This is a useful item for dynamotors, relays, battery chargers, model RR, etc. 8" x 12" x 8"—35 lbs. **Brand New** $8.95

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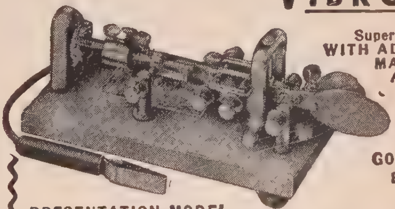

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PRESENTATION MODEL $29.95

Vibroplex presents the first really speed control key. An adjustable main spring permits operator to send slower or faster as desired. No more muddy signals . . . no sacrifice of signal quality. Suits any hand or any style of sending. Free of arm tension. Sends easily as pressing a button. Praised by operators and beginners alike. Try this new Vibroplex key! You'll be delighted. Other new popular Vibroplex keys from $15.95 up. At your dealer or
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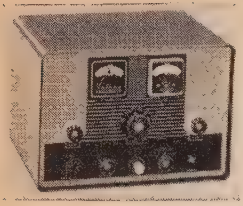
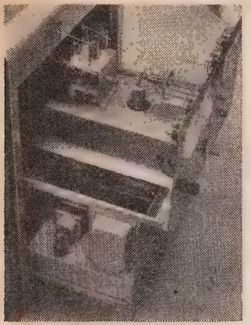


Johnson "Challenger"

There must be a lot of hams working for Johnson because they are always coming up with a new rig . . . and all of 'em look real good. This one should go into orbit fast (printer, please be sure to put in the "r" in orbit), 120 watts on CW and 70 watts on clamp tube modulated phone. Kit $114.75, wired $154.75. Goes from 80 thru 6 meters. Xtal osc. 6DQ6's in output. Gouge E on page 126 for more hot scoop.

National NC-400

National Company will introduce its model NC-400, a new communications receiver, at the I.R.E. Show, Booth 1401-1407. The new eighteen tube receiver has a frequency range of 540 kc to 31 mc in seven bands. It has an extreme selectivity range of 16 kc to 150 cps with *if* and crystal filter supplied. With accessory filters it has a selectivity range of 16 kc to 500 cps. Sensitivity is approximately one microvolt for a 10 db signal/noise ratio. For more data lacerate A on page 126.

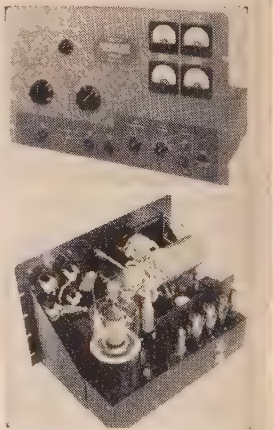


Ham TV

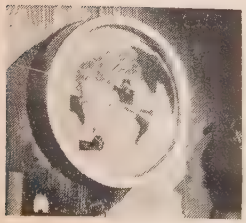
To the end of commercial amateur TV equipment, Electron Corporation offers this complete television station for operation in the range 420-450 mcs. This unit, capable of 50 watts rf output can transmit an excellent picture over a 30 to 40 mile range, providing of course, that a proper antenna is used.

Yes, you too can transmit weekly spectaculars. If your interest and curiosity are sufficiently aroused, obliterate C on page 126 for further dope.

Linear Amplifier



Creative Electronics, Stamford, Connecticut have come up with an interesting pair of shows for that low power ssb exciter; this called the "Airmaster H316" linear. That glassy eye-catching bottle is the new Amperex 6079/AX9908. . . . Endowedwith 500 watts of plate dissipation, this baby delivers a kool KW on all bands and affords the lowest tube replacement cost in any KW linear to date. The Creative "Airmaster" is literally loaded with interesting features. You owe it to yourself to investigate. Get started by mangling B on page 126 and we'll have them get the dope out to you, Pronto!



Beam Indicator

Tired of squinting at little needles as they indicate the direction of your rotary You're free—released. The photo shows what you can expect from Hy-Gains ne rotator-indicator system. This unit combines not only the old faithful rotator an brake assembly, but also provides a large translucent great circle map indicato of 16 inches diameter. The wedge of light, ten degrees wide at the edge of the i dicator, is geared to move on the map as the antenna rotates, showing both bea direction and width.

The map indicators may be obtained centered on either the east, west or mi western U.S.; for countries other than the United States, a compass rose is sup plied. Want to know more? Gore D on page 126 and be brought up to date.

HARRISON — "Ham Headquarters, USA," has all the newest *GLOBE* gear!

HARRISON has the New GLOBE Champion 350

$495⁰⁰

BUT, HARRISON'S easy terms and high trade-ins . . . will make it less than you think!

- ★ All modern design new cabinet.
- ★ New filtered keying circuit virtually eliminates key clicks.
- ★ Improved VFO circuitry for greater stability.
- ★ Tailored for more "power punch" in the voice frequency range.
- ★ Adjustable bias control for SB operation.
- ★ Improved shielding for TVI-protection and stability, eliminating RF feedback.

he new Globe Champion 350 is bandswitching 10-160M, 350w W, 275w AM, 450w SSB (PEP), with any 10w external exciter. xtensively TVI-suppressed, filtered and bypassed. High level lass B modulation maintained without usual clipping distortion ith commercial type compression circuit. Pi-Net output circuit 8-300 ohms, built-in VFO, push-to-talk, antenna changeover elay, and improved time sequence keying. Final tubes air-ooled. Single knob bandswitching. Cabinet 12x21⅜x17".

HARRISON has the GLOBE Phone Patcher

ew phone patch, operates
OX on SB, Push-to-talk on
M, with all popular Ama-
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ction 500-8 or 3.2 ohm
peaker. Simple to install,
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ill without energizing the
mttr. . . . Completely
hielded.

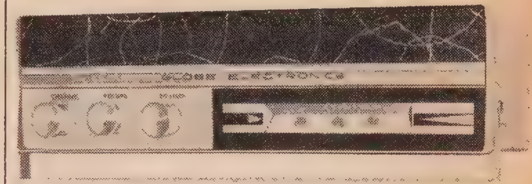
wired only:
5⅜ x 1⅝ x 9
complete: **$29⁹⁵**

ARRISON has the GLOBE VOX-10

ir voice operated control, with extra contacts for auxiliary rcuits. Plug in socket at rear of DSB Xmttr. Adaptable for out, Champ and similar Xmttrs. W/T: **$24.95** Kit: **$29.95.** -10: Anti-trip accessory for VOX, W/T: **$9.95.**

NEW 11 METER BAND
CITIZEN'S RADIOPHONE

May be used by anyone! NO EXAMINATION REQUIRED.



COMPLETE WITH CRYSTALS FOR ONE CHANNEL AND PUSH-TO-TALK MICROPHONE **$129⁹⁵**

Features of the New Citizen's Radiophone

- ★ Universal operation. One unit works on 115V AC or 12V mobile. Operates in Home, Office, Car or Field. No tests or examinations required. Any citizen over 18 years of age may use any of the FCC-assigned 22 channels in the 27mc range (11 meters) for transmitting and receiving.
- ★ EXCLUSIVE! Channel switch allows choice of three channels for operation. Receiver and broadcaster units are tuned to same channel simultaneously.
- ★ Operation extremely easy; only three controls; Channel, Squelch and On/Off/Volume. Squelch control subdues background noise for muted standby operation. Offers push-to-talk operation for instantaneous transmission or reception.
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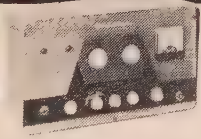

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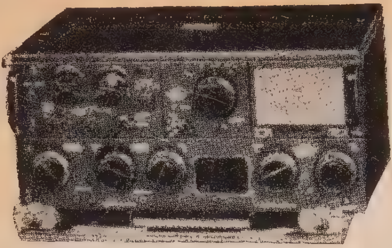

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IN THE BEGINNING

[*from page 49*]

But the deck wouldn't stay still. Each tilt sent his inexperienced land-lubber legs toward the rail. By now not only his legs were unsteady; so was his stomach. With expert timing, the rolling ship careened Walt to the rail where his unseeing eyes stared deeply into the sea. It would have been an awfully poor time for a ship to have sent an SOS. Walt wouldn't have been a hero. He was seasick.

The Tesla Coil

With Walt at sea, Hal and Sam felt free to experiment with some of his electrical gear located in the cellar. One Saturday morning they were in the basement rummaging around Walt's apparatus while their dog sniffed the delights of unexplored corners.

Eventually they came upon a very big coi with wires running to a make-shift key and batteries. They didn't recall seeing this before and wondered what is was for.

The gadget arousing their curiosity had a few primary turns inductively coupled to a long secondary coil. The primary circuit had a key, batteries, condenser and spark gap. Condenser discharge in the primary circuit created high frequency high voltage across the secondary coil.

It was the well known Tesla coil principle for obtaining high frequency charges for laboratory work or for amusing effects. In laboratories they had been made to withstand 20,000 volts across the primary condenser to produce thirty inch secondary sparks. Using forced ai to extinguish the primary spark, voltages o 30,000 created sixty-four inch sparks.

Hal and Sam didn't know anything about Tesla coils before one of them touched the key. But immediately after pressing it they both got a quick nerve-shattering education.

Several things happened simultaneously. They were so engrossed they didn't hear thei mother coming down the cellar steps. The dog heard her though. Just as she reached the bottom of the stairs, he raised up from the floor with tail wagging. That was the instan the key got pressed and a long spark leape

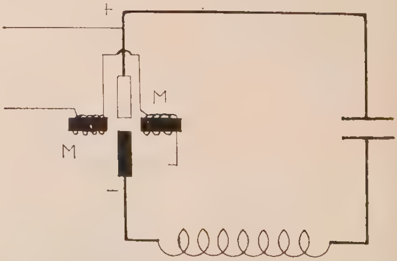

Fig. 18—Oscillating circuit of arc transmitter showing electromagnets (m) used to obtain more energy.

rom the coil to the end of his tail.

For several weeks after that the word "wireess" was *off limits* in the house. And it was ays before the brothers revived their interest n wireless. Their attention was absorbed in ther matters; such as carefully adjusting sitting ostures to relieve sensitivity bottom-side. The og seemed the only happy one — his "wag" tayed as friendly as ever.

[*to be continued*]

UNIK [*from page 38*]

One difficulty was the presence of WWV on 0.0 *mc* which came through fairly strong even ate in the wintry evening. This situation exluded the 19.997 *mc* (probably the strongest gnal) as well as 19.995 *mc* in its weak condion. The chances of 19.993 *mc* signal being ontinuously on the air was also questioned. The ransmissions may have been occurring at widely cattered periods, for short intervals, which ight also account for missing the signals.

The Russians have since made a request for dditional reports and recordings of Lunik gnals. They appealed to professional and mateur stations throughout the world.

Meanwhile concerted efforts were being made n the U. S. to determine the cause of our dd failure to pick up Lunik in outer space. ■

FO [*from page 37*]

hich can be used, is to short out L3, disconect C7, disconnect C8 from the collector and onnect it to the emitter. The output transistor ill then function as an emitter follower (simir to cathode follower). The output will be ightly lower, but in some cases better stability ith output circuit loading might be obtained, lthough with the companion amplifier shown ere, loading stability was better with the output taken from the collector.

When the *vfo* is calibrated the amplifier hould be connected, with power applied to it, maintain normal loading.

After the companion amplifier has been ined up, turn off the *vfo* to find out if any *rf* utput is still present. If so, self-oscillation may taking place in the amplifier. In this case, ther slightly detune L1 (in the amplifier), or ad L1 or L2 down with a shunt resistor.

Although the four Pen-lite cells will hold up r many months, it is best to check them ocasionally, and then replace them after their tal potential has dropped below 5.6 volts. he car battery, or any other fluctuating 6 lt *dc* source, should not be used, because the equency of the transistorized *vfo* is very sentive to varying potentials.

The *vfo* frequency should settle down withone minute after its potential has been apied, and many hours of enjoyable drift-free eration will be experienced. ■

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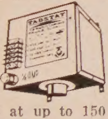

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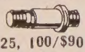

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NEW PRINT CKT-PANEL, 11x12x.062" **$2**
IRISH TAPE 1200' HiQlty, ...3 for **$5**
BANDPASS 60 or 90 or 150 Cys .. **each $2**
1N34A **45¢@**, 15/**$5**; 1N35 **$1**; IN38 **70¢@**;
XTAL OVEN—115V&Thermostat **$2**
Blower 24VDC/100CFM **$3.98**
Blower AC/Miniature 6&12VAC **$1.00**

AN Voltmeter 0-30VDC **$2.49@**, 3 for **$6.00**
Xmitting Mica's .006 @ 2500V, 5 for **$1.00**
Relay 4PDT/3Acts/12 to 24VDC **$1@**, 6/**$5**
Hvy Dty 115V/60Cy Selsyns, 2 for **$9.00**
Miller 2.5MH/2.5&5Mtr Chokes ....8/**$1.00**
Vibrators 6 or 12VDC **$1.49@**; 4/........**$5.00**

New Variacs/**or** equiv 0-135V/7.5A **$15.30**
New Variacs/**or** equiv 0-135V/3 Amp **$10.65**
New Variacs/**or** equiv 0-132V/1.25A **$7.25**
RF-MTR GE/475 Ma & 5 Amp **$4@**, 2/**$7**
DC-METER Dejur 800 Ma/3½" **$3@**, 2/**$5**
DC-METER One Ma/4" Rd. **$5@**, 2/**$8**
RF-MTR Weston 750Ma/TC... **$4@**, 2/**$6**
DC MTR 100Ma/2½"...............**$3@**, 2/**$5**

W.E. 388A HiFreq Doorknob
Tube **up to** 700Mc's Special....3 for **$1**

BC696/3 to 4 mc's good condition **$5.95**
AN-ARR2/RCVR less tubes A-1 cndtn **$1.95**
RDZ/USN 200-400 Mcs Rcvrs As Is .. **$25**
RAX/MPN rcvr covers 4 bands 1.5 to 9 mc's 8 tubes has BFO Vernier....... **$24.00**
60Mc's/IF-Strip **$5.00**
866A/2 Combo & Fil XFMR/7.5KV Ins 5.98
LM-7 Navy Freq-Mtr to 20 mcs........... **$72**

BC221 Freq Mtr—gd cndtn...................**$90**
ART13—Used Good Cond **$59**
TS34AP—W.E. scope used G/ctdn **$69**
G.E./YRS-1 Side Band Selector............**$45**
829B Socket 85¢, 2/$1.50. 813 Socket **$1**
4x150 Ceramic/LOKTAL............**2 for $1.00**

Dumont 208B/5" Scope Tested................**$65**
Precision E200C Sig-Gen 88KC **to** 240Mc **$69**
Precision E400 sweep-gen 3 **to** 900MC **$115**
Simpson 303VTM tested gtd **$45**
RCA-WV98A voltohmst Sr/VTVM ... **$50**
Millen 90651 "GDO" 1.7 **to** 300 MC **$30**
Millen 90903/3" modulation scope **$23**
I-177 Tube Tester Army/Hickok **$25**

W.E. 416B Microwave Triode up to 4000 Mcs. **High Transconductance 25 to 50000 mhos** use as pre-amp. mixer or oscillator HiMu—Low Noise, (Gvt Cost $58) Tubes removed from Equipment & Tested! SPECIAL **$6 ea, 2/$10**

TRANSFORMERS all 115V/60cy/1Ø
6V @ 8A, 5V @ 3A & 1200VCT@200ma **$5**
TPF/540VCT @ 30ma/6.3V @ 2A **$2**
TPF61/500VCT @ 70ma & 6.3V @ 4A **$3**
TPF62/550VCT @ 250ma & 6.3VCT @ 2.5A & 12.6V @ 3.5A. & 5V @ 2A **$5**
TF02/2.5VCT @ 10A/5KV......................... **$4**
TR400R/2x16V @ 1A ea. **$3.45**
TF05/7.5VCT/12A/15KV KENYON **$9**
TF27 is 10VCT/5A or 220V Pri 20V @ 5A Kenyon H'sld....... Special **$4.95, 2 for $9**

FILTER & SWINGING CHOKES

CH1029 CHOKE 8 Hy @ 750ma............. **$12**
CH1030 CHOKE 6 Hy @ 1.25A **$18**
CH1031 CHOKE 0.6 Hy @ 3.2A.............**$10**
CH1034 CHOKE 5 Hy @ 500ma.............. **$6**
CHOKE 8 Hy @ 150ma **$2**
CTC/RS8150/8 Hy @ 150ma/80Ω......... **$3**
CTC/RS8250/8 Hy @ 250ma/90Ω.......... **$5**
CTC/RS8105/8 Hy @ 105ma/100Ω....... **$2**
STAN/C2700/2-12 Hy @ 200ma/80Ω.. **$6**
STAN/C2701/3-12 Hy @ 350ma/80Ω **$10**
KEN/T509/7-22 Hy @ 200ma/140Ω..... **$8**
KEN/T510/6-19 Hy @ 300ma/125Ω .. **$9**
CH1011 RCA/10 Hy @ 150ma..**$2 @, 3/$5**
CH1003 UTC/10 Hy @ 125ma.......... **@ $2**
Modulation xfmr BC610/16KCT, Pri, 8330Ω sec@250ma **$24**

"TAB" for NEW TRANSISTORS!

2N38	$.98	2N255	$1.30	2N441	$3.00
2N155	3.25	2N256	1.45	2N234A	1.36
2N156	4.45	2N277	4.50	CK721	2.35
2N174	12.00	2N278	5.50	CK722	.95

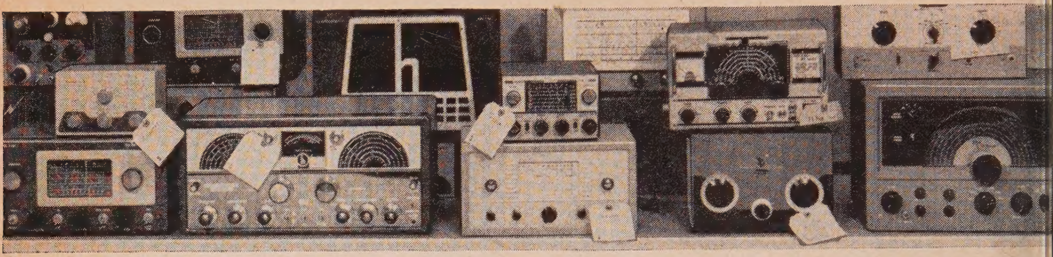
Postpaid 48 States Orders $10

WE BUY! SELL & TRADE

Send 25¢ for Bonus Catalog!

For further information, check number 54 on page 126.

Allied's big clearance sale of reconditioned equipment...



Biggest trading in Allied history brings you top values like these...

ALL WITH 90-DAY NEW EQUIPMENT WARRANTY!

Barker & Williamson

5100 Transmitter	$299.00
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SX-73 Receiver	249.00
S-38 Receiver	29.50
S-38B Receiver	32.50
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SX-88 Receiver	349.00
SX-62A Receiver	199.00
SX-100 Receiver	225.00
SX-101 Receiver	295.95

Harvey-Wells

TBS-50 Transmitter	49.00
T-90 Transmitter	149.00
T-90 Power Supply	69.00
Bandmaster and VFO unit	99.00

Heath

VFO	17.00
AT-1 Transmitter	27.50

Johnson

Viking Ranger Transmitter	$189.00
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Viking II Transmitter	199.00
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Ocean Hopper Receiver	8.95
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NC-44 Receiver	39.95
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NC-66 Portable Receiver	85.00
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NC-183 Receiver	169.00
NC-300 Receiver	279.00
NC-188 Receiver	115.00

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RME-45 Receiver	85.00
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15-DAY FREE TRIAL. Try any of this equipment under your own conditions; if in 15 days you're not completely satisfied, return it for full refund, less only transportation costs.

90-DAY WARRANTY. Allied reconditioned equipment is covered by the same 90-day warranty against defects in material or workmanship which covers brand-new equipment.

100% FULL RETURN VALUE on your purchase of any Allied used equipment, if traded in on a piece of new equipment within ninety days. Take advantage of our "highest trades".

EASY TERMS AVAILABLE—ONLY 10% DOWN!

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Mail, phone or wire your order to Jim Sommerville, W9WHF, Allied Ham Shack

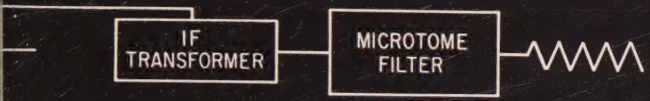
HIGHEST TRADES
ANYWHERE

ALLIED RADIO
100 N. Western Ave., Chicago 80, Ill.

For further information, check number 55 on page 126.

ONLY NATIONAL'S NC-109 HAS THE NEW MICROTOME FILTER

For further information, check number 2 on page 126.



FEATURING:

- Five degrees of sharp selectivity with variable bandwidth from 50 to 4000 cycles (6 db down).
- Deep, sharp phasing notch capable of phasing within 250 cycles of desired signal.
- Desired signal cannot be phased out on AM.
- Provides up to 10 db more gain at sharpest position — no more losses!

HY IS THE NC-109 FOR YOU?

ional's new NC-109 is the lowest priced general coverage
eiver available today with the exclusive new **Microtome** filter and
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o 40 mc in 4 bands, including broadcast band. Voice, CW or SSB.

YOURS FOR ONLY $^{\$}19^{95}$ DOWN*

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ay and try the NC-109 — you'll agree it's the finest amateur
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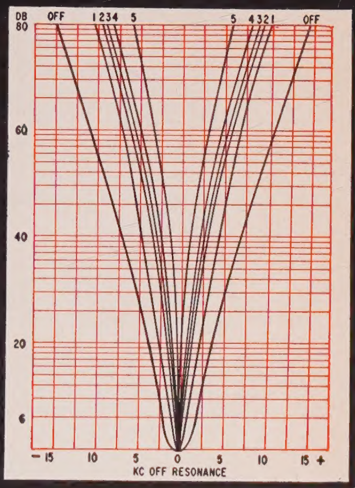
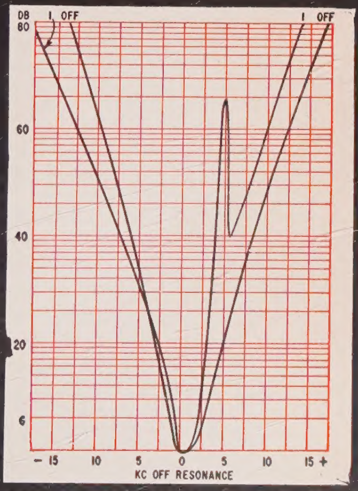


IF SELECTIVITY CHARACTERISTICS



MICROTOME FILTER SELECTIVITY CHARACTERISTICS

$19.95 down
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out of 10 U.S. Navy Ships use National Receivers

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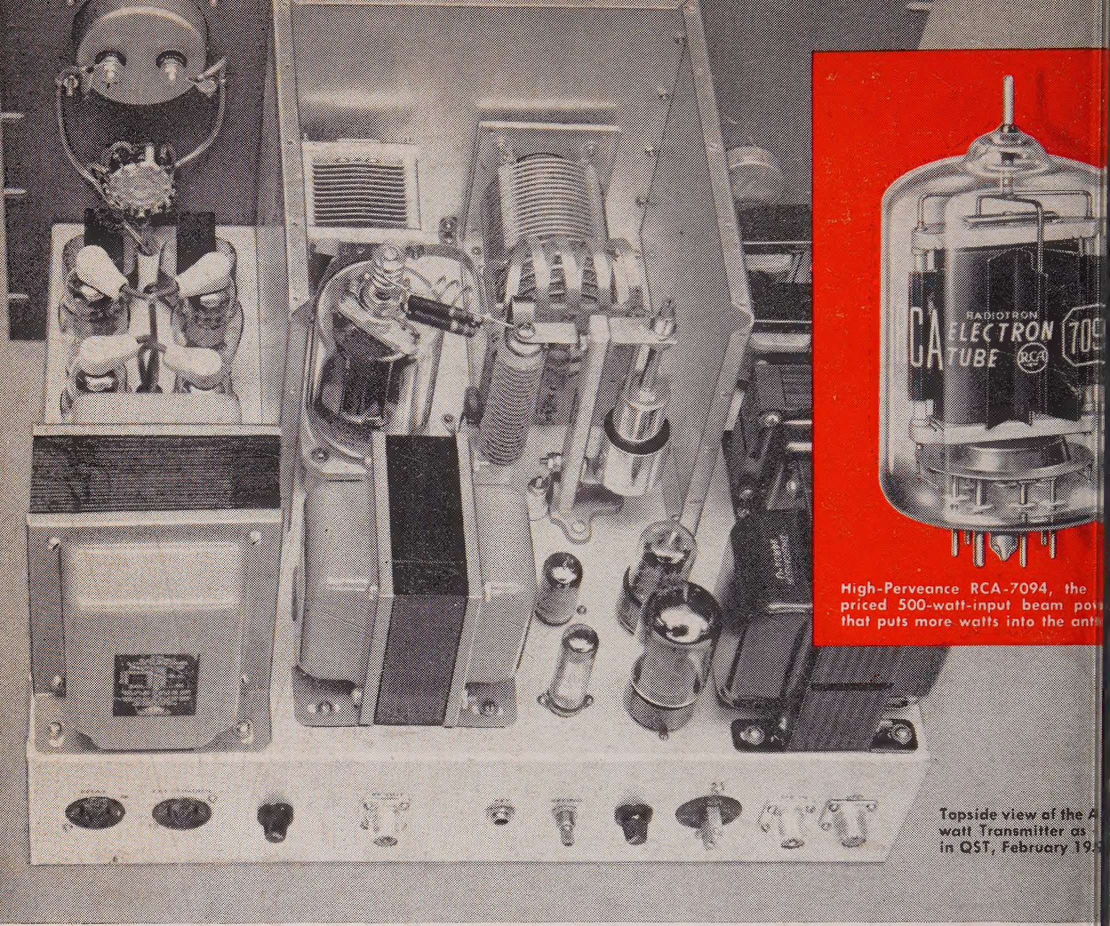
National

Since 1914
MALDEN 48, MASS.

BURTON BROWNE/New York



High-Perveance RCA-7094, the
priced 500-watt-input beam po
that puts more watts into the ant

Topside view of the A
watt Transmitter as
in QST, February 19

Again QST DOES IT...

...with an RCA-7094

Pictured here is QST's recent 500-watt transmitter. Note the professional layout—ready to go on any band from 10 to 80. Then note the power tube in the final socket. It's an RCA-7094 Beam Power Tube—and RCA is proud to see it there.

Why is the RCA-7094 a growing favorite with transmitter men going QRO? This: RCA-7094 is a high-perveance, high-power type—takes 500 watts input on CW with only 1500 volts on the plate! RCA-7094 has high power gain—drives to full input up to 60 Mc with less than 5 watts driver output (from a single RCA-2E26 or even the RCA-5763). RCA-7094 will deliver more watts to your antenna than low-current, high-voltage types with the same input *because the plate-voltage swing is lower —and, consequently, plate-circuit loss is lower.*

So for a lot of output watts for your power tube dollar...for a half-gallon input with lower voltage-rated components...for better plate loading at higher frequencies, design around the RCA-7094. It's available through your RCA Industrial Tube Distributor. For a technical bulletin on RCA-7094, write RCA, Commercial Engineering, Section F-15-M, Harrison, N. J.

RCA-7094
Typical Operating Conditions (IC
at 60 Mc

Type of Service	CW	AM
DC Plate Volts	1500	120
DC Grid—No. 2 Volts	400	40
DC Grid—No. 1 Volts	−100	−13
DC Plate Ma.	330	27
DC Grid—No. 2 Ma. (approx.)	20	2
Required Driver Power Output Watts (approx.)	4	
Useful Power Output Watts (approx.)**	340	24

*Maximum-Signal
**90% Output Circuit efficiency

RADIO CORPORATION OF AMERICA
Electron Tube Division **Harrison, N. J.**

For the name of your
distributor, call West
by number and ask f
Operator 25.